

The Lived Experience of Percutaneous Injuries Among US Registered Nurses: A Phenomenological Study

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Boston College

William F. Connell School of Nursing

THE LIVED EXPERIENCE OF PERCUTANEOUS INJURIES AMONG
US REGISTERED NURSES: A PHENOMENOLOGICAL STUDY

A dissertation

by

KAREN A. DALEY

submitted in partial fulfillment of the requirements

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The Lived Experience of Percutaneous Injuries Among US Registered Nurses:
A Phenomenological Study

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ABSTRACT

The purpose of this study was to understand the lived experience and meanings of percutaneous injury (PI) and its aftermath among US registered nurses. An interpretive phenomenological approach was utilized to carry out the study which included nine percutaneous injury experiences. Van Manen's existential framework was used as a reflective guide.

Findings from this study emerged as three essential themes which were common to all participants: *being shocked: the potential of a serious or life-threatening infection; needing to know it's going to be okay*; and *sensing vulnerability*. The first theme, *being shocked*, was identified as the primary mode of living with the sudden occurrence of PI. In the moment of injury, participants' language reflected shock and an immediate consciousness of the potential threat of a serious or life-threatening infection. Nurses' responses were visceral and emotional. All acted on their need to reduce foreign blood contamination and the urgency they felt for immediate care. *Needing to know it's going to be okay* represented the initial meaning of living in the aftermath of PI as nurses assessed their risk and sought post exposure intervention and caring responses from others. *Sensing vulnerability* was identified as the secondary mode of living in the aftermath of PI as participants reflected on the fragile nature of health into the future, distinguished between supportive vs. non-supportive relationships in their overall PI experience, and identified the need to be vigilant in the future with respect to their health, life and PI prevention. Together, these three essential themes and their dimensions represent the

essence and meanings of percutaneous injury and its aftermath for at least one group of US registered nurses.

Findings in this study support the conclusion that the lived experience of PIs and its aftermath imposed a significant psychological burden on nurses. These findings offer a better understanding of the essence and meanings of PIs and their aftermath and contribute knowledge to inform nursing education, nursing practice, health policy and future research.

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Chapter 1

Aim of the Study

At a national nursing knowledge conference held in Boston in 1998 and attended by nurse theorists and scholars from across the country, a consensus statement was drafted that defined nursing as a human practice discipline that facilitates well-being by using a scientific knowledge base and values in a caring relationship with the patient (Roy, 1999). The conference was convened to discuss and synthesize various perspectives on knowledge development, particularly as they relate to nursing practice.

The ethical tradition of nursing is based on overriding professional values, obligations and goals (American Nurses Association [ANA], 2001a). Newman, Sime, and Corcoran-Perry (1995) describe nursing's commitment to caring as a moral imperative in relation to the human health experience. Nursing goals include prevention of illness, mitigation or alleviation of suffering, and the protection, promotion, and restoration of health (ANA, 2001a). Nursing goals also encompass development of knowledge that guides nursing practice in the optimization of health for individuals, families and communities. The overriding aim of this study is to advance nursing knowledge in relation to understanding of the lived experience of registered nurses who sustain percutaneous injuries, and, ultimately, to permit change that will improve post-injury care.

As a practice discipline, nursing's focus is the care and well-being of human beings. It is, unquestionably, in the best interests of nurses, patients and employers that nurses be supported in their efforts to provide good care. In recent years, health and safety issues have assumed a more prominent place among the realm of concerns that detract from nurses' ability to provide optimal care for patients. Results from an online health and safety surveys conducted by the ANA in

2001 and 2008 indicate that occupational exposures or injuries serve as major contributors to nurses' workplace stress (ANA, 2001b; ANA 2008). While generalizability of findings may be limited due to self-selection given the voluntary nature of survey participation, results do seem to indicate that caregivers' health and safety is an increasingly important focus in the healthcare arena, particularly as a growing number of risks are associated with the act of providing care for others.

The US Department of Health and Human Services also includes occupational safety and health among its key national health indicators (US Department of Health and Human Services, 2005). Healthcare ranks among the most dangerous of United States (US) industries in relation to on-the-job injuries and exposures. One source (Dotter, 1998) reported the annual injury and illness rate among healthcare workers in 1994 as 9.4 per 100 full-time employees compared with 8.7, 10.3, and 14.0 per 100 among fulltime paper mill workers, coal miners and steel mill workers, respectively. According to a 2002 report from the US Bureau of Labor Statistics, the rate of occupational illnesses and injuries resulting in lost time within the healthcare industry is 44 percent higher than for non-healthcare employers (US Bureau of Labor Statistics, 2004).

Occupational hazards for nurses and other healthcare workers include: 1) ergonomic hazards from heavy lifting which can result in disabling back injuries; 2) exposures to biological hazards to infectious disease such as HIV through percutaneous injuries; 3) exposures to potentially harmful chemicals such as anesthetic waste gases like ethylene oxide or chemotherapy agents; 4) workplace violence that may lead to injury or assault; 5) respiratory hazards such as those associated with laser plumes or poor indoor air quality; 6) laser hazards that can result in tissue burns; and 7) radioactive material and x-ray exposure that can result in cancers (US Department of Labor, nd).

Biologic and infectious hazards constitute one of the most familiar occupational risks faced by healthcare workers in the US and around the world. Internationally, it is estimated that as many as 8 million healthcare workers annually are at risk of occupational exposure to bloodborne pathogens (Occupational Safety and Health Administration [OSHA], 2001). Healthcare worker exposure to bloodborne pathogens which result from needlesticks and other sources of percutaneous injuries remain a major public health concern within the US.

For many exposed workers, the personal burden and impact of these injuries is significant (Armstrong, Gorden & Santorella, 1995; Gershon et al., 2000; Henry et al., 1990; Howsepian, 1998; Siebert, 2003; Treloar, Higginbotham, Malcolm & Sutherland, 1995; Worthington, Pino & Bergeron, 2003; Worthington, Ross & Bergeron, 2006). For some, the cost paid may even involve the loss of a job one loves, a personal decision to leave a position or, in extreme cases, to make a career change – sometimes resulting in a societal loss of experienced, dedicated caregivers. Associated economic costs are also significant and involve indirect and direct costs for both employers and workers – including lost workdays and productivity, costs of post-exposure testing and prophylactic drug administration as well as costs associated with replacement staff and clerical time.

Needlesticks are among the most efficient modes of bloodborne pathogen transmission, contributing the highest proportion of percutaneous injuries (PI) sustained by healthcare workers (Centers for Disease Control [CDC], 2001). Percutaneous injuries have been defined as “injuries through the skin” (National Institute of Occupational Safety and Health [NIOSH], 2004). Following percutaneous injury with contaminated sharps such as hollow-bore needles, suture needles, and scalpels, increased risk of bloodborne pathogen transmission occurs.

Needlestick injuries are defined as: “a penetrating stab wound from a needle (or other sharp object) that may result in exposure to blood or other body fluids” (MedicineNet.com, 2007). Currently, the CDC reports percutaneous injuries from contaminated needles and other sharps devices among healthcare workers as a single category of exposure (CDC, 2008). For the purposes of this study, all blood-contaminated sharps injuries, including needlesticks, will be referred to as percutaneous injuries.

Among approximately 23,000 percutaneous injuries voluntarily reported to the CDC’s National Surveillance System for Hospital Health Care Workers (NaSH) by hospitals between 1995 and 2003, needlesticks accounted for approximately 70 percent of percutaneous injuries in that 8-year period (CDC, 2008). Another report, issued in 2003 by the Exposure Prevention Information Network (EPINet) located at the University of Virginia, indicated that among nearly 1800 percutaneous injuries, needles (including hollow bore and suture needles) accounted for 77 percent of injuries reported (International Healthcare Worker Safety Center, 2003).

The next section describes what we currently know about the problem of percutaneous injuries – including incidence and associated outcomes as described in the current literature – as well as the existing knowledge gap. Associated outcomes include bloodborne pathogen exposure and resulting infections, PI-associated financial costs, and what is currently known about the lived experience of PIs.

Phenomenon of Interest – Percutaneous Injuries

Current knowledge regarding percutaneous injury outcomes. The problem of percutaneous injuries among health care workers has long been recognized as significant since it accounts for as many as 80 percent of bloodborne pathogen exposures among nurses and other healthcare workers (CDC, 2001). Estimates of the annual number of PIs are fairly imprecise and

based on data extrapolated from regional and national voluntary data-sharing networks such as EPINet and NaSH.

The CDC currently estimates that as many as 800,000 work-related percutaneous injuries occur annually in the US – of which about 50 percent go unreported (Rosenstock, 2002), warranting additional future study of the reasons for non-reporting. Of those, approximately 385,000 needlestick injuries are estimated to occur annually in hospital settings (CDC, 2008). Beyond the information described in published anecdotal reports, little is currently known about the experience of these injuries by healthcare workers. Given the persistent and widespread incidence of PIs as well as their potential associated impact, a better understanding of these injuries as they are experienced could provide a foundation for better informing caregivers, colleagues and policymakers regarding the healthcare needs of individuals who sustain PIs. A better understanding of these injuries and their impact supports two goods: those of the nurse whose needs relate to the experience of the injury, and those of society, which derives benefit from a healthy nursing workforce.

Bloodborne pathogen transmission risk & resulting infections. Bloodborne pathogens of major concern for healthcare workers include human immunodeficiency virus (HIV), hepatitis B (HBV) and hepatitis C (HCV). A 2003 World Health Organization report places estimates of the average annual number of US healthcare worker exposures to HIV, HBV, and HCV through percutaneous injuries at 8,000, 7,100, and 22,000, respectively (Prüss-Üstün, Rapiti & Hutin, 2003). Compared with the estimated number of US workers who annually sustain PIs, the proportion of actually exposed to HIV, HBV and HCV are reported as 0.1, .09, and 0.3 percent, respectively (Prüss-Üstün, Rapiti & Hutin, 2003). According to studies of US healthcare workers who have sustained PIs from infected source patients, the average risk for occupational

transmission of HIV, HBV and HCV are 0.3 percent, 6-30 percent for non-immune workers, and 1.8 percent, respectively (CDC, 2001).

Annually, exposures to over 20 different bloodborne pathogens (Bolyard et al., 1998) are estimated to result in more than 1,000 infections nationwide – the most common and potentially life-threatening infections are HIV, HBV, and HCV. Significant advances in preventive therapies and treatment for HBV and HIV transmission have occurred over the past two decades (CDC, 2005). Widespread adoption of standard precautions in the mid-1980s, in combination with the 1992 OSHA Bloodborne Pathogen Standard (29 CFR 1910.1030) which required employers to provide free HBV vaccination to at-risk healthcare workers, have reduced occupational HBV infection rates from nearly 17,000 cases in 1983 to fewer than 400 recorded cases in 1999 (CDC, 2002).

The actual number of healthcare workers believed to have been infected with HIV between 1985 and 1999 as the direct result of occupational exposure via PI is relatively low – .05 percent per 112,000 HIV exposures (8000/year x 14 years) versus the CDC HIV transmission risk estimate of 0.3 percent. According to the most recently available data, the CDC has recorded 57 cases of occupationally-acquired HIV infection from PIs among US healthcare personnel between 1985 and 1999 (NIOSH, 2004). Only three occupationally-acquired HIV infections have been reported by the CDC since 1995.

Further analysis indicates that 24 (42 percent) of the HIV infections were sustained by nurses and 16 (28 percent) by lab technicians. Eighty-eight percent of the infections (51) were attributable to percutaneous injuries. All percutaneous injuries were described as either moderate (penetrated the skin with blood apparent) or deep (puncture or wound with or without bleeding). An additional 140 cases of HIV have been categorized

by CDC as possibly resulting from occupational transmission. No occupationally-acquired cases of HIV are known to have occurred since 1999 (CDC, 2007; Do, Ciesielski, Metler, Hammett, Li, & Fleming, 2003).

Current CDC recommendations for post-exposure HIV prophylaxis (PEP), based on level of transmission risk which varies depending on type and severity of exposure risk, typically include an initial four week two-drug regimen with addition of a third drug for exposures with increased risk for transmission (CDC, 2005b). Five classes of antiretroviral agents are currently available to treat HIV infection. The goal of protecting against virus transmission – and the associated treatment – is very different than that of treating HIV (Bassett, Freedberg & Walensky, 2004). With established HIV infection, treatment is aimed to attack the virus at multiple sites of action. Following a PI, the goal of prophylaxis is to prevent small amounts of virus from spreading to lymph nodes.

Side effects of potent HIV prophylaxis regimens can add to the burden of these injuries by compromising the health status of healthcare workers who sustain PIs. Anecdotal evidence exists to suggest antiretroviral regimens are tolerated more poorly among bloodborne pathogen-exposed workers than among persons infected with HIV taking long-term therapy (CDC, 2005a; Gerberding, 2003; Wang et al., 2000). Provider considerations in the selection of a specific HIV PEP regimen, therefore, should be strongly influenced by severity of exposure, stage of illness of the source patient, and agents known to be best tolerated over the short-term. Increased risk for HIV seroconversion has been linked to exposure to a larger amount of blood from the source patient as indicated by: (1) a device visibly contaminated with the patient's blood; (2) injury involving a hollow-bore needle that had been placed directly in a patient's

artery or vein; (3) a deep puncture; or (4) exposure to blood from a source patient in the late or terminal stage of illness (Cardo et al., 1997; CDC, 2001).

Follow-up recommendations following PIs include serial testing and monitoring of the healthcare provider for seroconversion for at least six months after the HIV exposure occurs. Subsequent to baseline testing at the time of exposure, serial testing should be performed at 6 weeks, 12 weeks, and 6 months post-exposure. A longer period of follow-up (e.g., for 12 months) is recommended for workers who become infected with HCV after exposure to a source who is co-infected with HIV and HCV (CDC, 2005).

Precise estimates of the annual number of cases of occupationally-acquired HCV range from two to four percent of exposed workers (Rosenstock, 2000). Of 37,000 new HCV cases diagnosed in 1995, it is estimated that between 720 and 1400 occurred in occupationally-exposed healthcare workers (Jeffress, 2000). There is no evidence to support administration of chemoprophylaxis following HCV exposures, although there is evidence to suggest that early detection and treatment following HCV seroconversion contributes to improved viral clearance (Jaekel, 2001).

While HBV vaccination and HIV chemoprophylaxis have been shown to be extremely effective preventive therapies in recent years, there is also evidence to suggest they are by no means absolute in relation to their effectiveness (Bassett et al, 2004; Cardo et al., 1997; Szmuness et al., 1980). One nonrandomized, retrospective, case control study of HIV-exposed healthcare workers following PI showed post-exposure administration of zidovudine (AZT) was associated with an 81 percent decrease in likelihood of transmission (Cardo et al, 1997).

Findings from a landmark double-blind study of HBV vaccine efficacy involving more than 100

high-risk individuals revealed development of subclinical infection in 1.4 to 3.4 percent of vaccine recipients (Szmuness et al., 1980).

PI-associated financial costs. PI cost data are based largely on average annual US estimates. Direct costs (baseline and follow-up testing and treatment) are estimated to approach between \$500 and \$5000 per exposure depending upon the type of treatments provided (CDC, 2008; Jagger, Bentley & Juillet, 1998; US General Accounting Office, 2000). One calculation of cost related to PEP alone ranged from \$609 for monotherapy to \$1331 for a triple drug regimen (Scheid, Hamm & Stevens, 2000). The same study estimated the average cost of drug side effects at \$490.

Indirect costs include worker replacement, clerical time, and worker's compensation premiums. The average cost of care for individual workers in the first five years following bloodborne pathogen infection is estimated at \$1M (Jagger et al., 1998). As summarized in the next section, the human experiences and meanings of sustaining PIs beyond infection rates and associated financial costs have not been well-described in the literature.

Existing Knowledge Gap – The Lived Experience and Personal Meanings of PIs

Occupational injuries result not only in greater costs to the employer, but also a far greater human toll. Anecdotal evidence suggests that the psychological burden for nurses and other healthcare workers who are exposed to bloodborne pathogens through PIs extends beyond the physical outcome or cost of the exposure (Gershon et al., 2000; Henry et al., 1990; Howsepian, 1998; Seibert, 2003; Treloa et al., 1995; Wilmont, 2009; Worthington et al., 2003; Worthington, et al., 2006). Such exposures could conceivably increase job stress and contribute to job turnover based on findings from a number of studies (ANA, 2001; Clarke, Sloane & Aiken, 2002; Kettle, 2002; Watterson, 2004). However, with the exception of one qualitative

descriptive pilot study that explored the experience of 65 healthcare workers in a post-exposure management program (Gershon, Flanagan et al., 2000), and one cross-sectional study that measured and compared anxiety and depression scores among 370 Korean healthcare workers who did or did not report a needlestick in the prior year (Sohn, Kim, Kim & Han, 2006), research related to the human experience of sustaining PIs has not yet been undertaken.

This knowledge gap supports the need to explore the lived experience and meanings of sustaining PIs for nurses and other healthcare workers. Interpretive phenomenology is, therefore, the approach used to address this knowledge gap. The following section provides the study justification and its relevance to the nursing profession.

Study Justification and Relevance to Nursing

Registered nurses (RNs) are the largest healthcare worker group in the US, currently numbering more than 2.9 million (HRSA, 2004). Of the entire RN workforce, an estimated 2.4 million or 83 percent are employed in nursing. Nurses constitute the largest health care worker population and sustain the majority of PIs internationally, as well as more than half of the exposures that occur in the US (CDC, 2008; Prüss-Üstün et al., 2003). Recent HRSA projections indicate a supply shortfall of as many as one million registered nurses will occur by 2020 (HRSA, 2008).

There is ample evidence to suggest job stress, particularly in relation to the current nursing shortage, contributes to nurses leaving the job and profession and detracts from the ability of the healthcare system to provide for patient care needs (ANA, 2001; Clarke, Sloane & Aiken, 2002; Kettle, 2002; McNeely, 2005; Watterson, 2004). According to one source, current replacement cost estimates for one medical surgical registered nurse is approximately \$93,000, and \$145,000 for one intensive care unit nurse (Atencio, Cohen & Gorenberg, 2003).

A number of additional considerations support the need for seeking a clearer understanding of the phenomenon of sustaining PIs as experienced by registered nurses. The most compelling rationale relates to the lack of research in this area, despite nurses' own reports that fear of becoming infected is one of their greatest concerns and sources of job stress. In a 2001 ANA online survey of more than 4800 RNs across the US, 45% of respondents reported serious concerns about contracting HIV or hepatitis from a needlestick injury (ANA, 2001). In a more recent survey of registered nurses, 87% of RN respondents indicated that safety concerns influence their decisions regarding the type of nursing they practice and whether they continue to practice in nursing (ANA, 2008). The same respondents stated that PI and bloodborne pathogen exposures remain major concerns in the workplace. An important limitation of the ANA studies was sample selection bias that could undermine an accurate reflection of the scope of the problem.

Another multi-center study approximated the level of injury-related distress by collecting data on the amount of money healthcare workers would be willing to pay to avoid sharps injuries (Fisman, Mittleman, Sorock & Harris, 2002). In the study, workers who presented for care following a sharps injury were asked to respond to a hypothetical question: If they had been offered a reusable device that could have prevented their injury – knowing what they now knew – would they have been willing to pay 'x' amount of dollars out of pocket for it? The crude median amount study subjects were willing to pay to avoid injury was \$850; when adjustment made for patient risk status and work with an uncooperative patient at time of injury, the median amount was reported to increase to \$1270. Anecdotal evidence also suggests that needlestick injuries serve as a significant source of distress for nurses (Armstrong, Gorden & Santorella, 1995; Gershon et al., 2000; Henry et al., 1990; Howsepien, 1998; Seibert, 2003; Shalo, 2007;

Treloar et al., 1995; Wilmont, 2009; Worthington et al., 2003; Worthington et al., 2006).

Given the current and ongoing shortage of RNs – an underlying concern as well as contributing factor in relation to PIs – and the potential burden imposed by these injuries, an in-depth exploration of the lived experience of PIs represents a new and important focus for nursing knowledge development. As Willis and Lopez (2004) state: “.... specialized knowledge for the practice of nursing must reflect the lived, contextual realities and concerns of the clients for whom nurses provide care” (p. 726). As human beings and healthcare consumers, nurses are equally worthy of moral consideration in their own healthcare needs and deserve care that reflects their lived, contextual realities and concerns. Moreover, attendance to their healthcare needs allows nurses to better fulfill their promises of responsible care to society. A brief outline of factors that may influence or provide a broader context for the meanings of PIs as experienced by registered nurses follows.

Human Response as Context

For registered nurses in the United States who sustain PIs, the potential exists for serious health-altering consequences to occur. Nurses who experience PIs most likely sustain them in the process of providing direct care to patients. Factors that could conceivably shape the human response to the injury and its aftermath include: the circumstances surrounding the injury; knowledge level of the nurse in relation to bloodborne pathogen risk; personal health concerns of the nurse as well as close family and friends associated with the exposure; the quality of post-exposure care provided; and level of support from work peers, colleagues, supervisors, family and friends following the injury.

To support this study, a number of issues related to the context in which injuries occur will be explored including: What are registered nurses’ immediate responses to the experience of PIs?

What are the meanings of those responses? Do nurses' responses to the experience of PIs change over time? Do institutional culture, relationships and processes shape human responses to the experience? Study aims and questions are presented in the following section.

Study Aim & Questions

Nursing goals encompass activities that promote the care, health and well-being of human beings. When a nurse or other caregiver sustains a percutaneous injury, the caregiver assumes the role of the person who now requires care. The ultimate aim of this study is knowledge development for the advancement of nursing's purposes.

The purpose of this study is to explore and understand the lived experience, meanings, and aftermath of the phenomenon of sustaining a percutaneous injury for registered nurses. Four fundamental existential themes have been identified within phenomenological literature (Merleau-Ponty, 1962; van Manen, 1990) as belonging to the basic structure of the lifeworld experiences of all human beings. These four existentials – spatiality (space), temporality (time), corporeality (embodiment) and relationality (relationship) – served as helpful guides as questions were posed and reflected upon in the process of researching phenomenon.

The following are the study questions for this inquiry: 1. What are the major themes of the lived experience of percutaneous injury and its aftermath in relation to embodiment, space, time and relationship as perceived by registered nurses who have had the experience?; and 2. What are the subjective meanings that can be interpreted about human experiences of percutaneous injury and its aftermath as perceived by registered nurses who have had the experience? A brief overview of the proposed study design is presented in the next section.

Brief Overview of Design

In order to explore and understand the meanings of the human experience of sustaining PIs, an interpretive or hermeneutic phenomenological approach has been utilized. A human science which first originated with the work of Edward Husserl, phenomenology seeks out that which makes a phenomenon *what it is* – and without which, the phenomenon *would not be* (Merleau-Ponty, 1962). Foundational to hermeneutic phenomenology is the focus on interpretation of participant narratives in relation to various existential contexts and the use of a circular process of understanding – known as the hermeneutic circle – to uncover, through interpretation, the meanings of what is already there, but in need of expression in relation to a particular lived experience (Lopez & Willis, 2004).

In this study, individual participant descriptions were used to illuminate the nature and essential meanings of the lived experience of having sustained PIs. In-depth, face-to-face, individual interviews were conducted to elicit unfolding insights, language, and meanings in each participant's description of the phenomenon and its aftermath during the period from exposure to 24 months post-injury. All interviews were recorded and transcribed verbatim. Movement between the partial and the whole – individual descriptions and the more complete whole of all interviews – allowed for deeper understanding and reconsideration of essential meanings attached to the lived experience.

Van Manen's organizing framework of existential lifeworlds –fundamental structures of meanings experienced in everyday situations and relations (van Manen, 1990) that consist of the four themes or dimensions of spatiality, temporality, corporeality and relationality – were utilized throughout this study. These four themes guided reflection throughout the processes of data collection, data analysis, and organization of findings. Further details of study methods are

provided in Chapter III. Consistent with a hermeneutic phenomenological approach, discussion related to researcher interest, biases, and assumptions are presented in the next section.

Researcher Interest, Biases and Assumptions

Bracketing. Bracketing is a term borrowed from mathematics that first evolved in phenomenology as a methodological derivative of Husserl's transcendental subjectivity or primordial consciousness. In Husserl's view, the act of bracketing or *epoché* represented a legitimate methodological tool for cancelling out the natural attitude as a precursor to phenomenological inquiry. By keeping the natural attitude and one's preconceptions, assumptions and judgements about the outer world at bay, Husserl believed the method of epoché made it possible to grasp the nature of phenomenon as experienced in the world, since, in his view, it provided description that was exact, unadulterated and acontextual - as originally intended by the person from whom it was offered (Paley, 1997).

Both Merleau-Ponty and Heidegger challenged Husserl's belief that personal bias and preconceptions could be extinguished or bracketed in the act of phenomenological reduction. Merleau-Ponty (1962) wrote:

The most important lesson that the reduction teaches us is the impossibility of a complete reduction... If we were absolute mind, the reduction would be no problem. But since, on the contrary, we are in the world, since indeed all our reflections are carried out in the temporal flux on which we are trying to seize, there is no thought which embraces all our thought (p. xv).

Heidegger argued that it is impossible – and even undesirable – for researchers to rid themselves of the background of understandings or personal knowledge held in relation to an experience or phenomenon. He believed past knowledge, preconceptions and experiences

remain an important part of who we are as human beings and researchers, and, as such, serve as useful and meaningful guides to phenomenological inquiry. Bracketing is, as conceptualized by Husserl, not consistent with an interpretive or hermeneutic approach to phenomenology. Rather, in a hermeneutic approach, the process of bracketing becomes one of facilitating a conscious awareness of personal bias and presuppositions and, in doing so, adopting a perspective of unknowing (Munhall, 2007), albeit tentative, by which the researcher remains open to all the possibilities of experience and is able to reach a more insightful, discerning interpretation of the data. Part of that process of researcher openness to the lived experience of participants is a realization of the existence of and interrelationship with our own experience, assumptions, and biases.

Recognizing that my personal knowledge and experience fail to encompass all there is to know about this phenomenon, and given the fact that aspects of human experience are both revealed and concealed, steps were employed throughout the processes of interviewing, data coding, and interpretation to promote open, thorough and in-depth exploration of participant experiences. Priority was given to making my understanding, beliefs, biases, and assumptions explicit throughout the research processes by keeping notes, journal writing, peer and member checking, debriefing, and using objective second and third parties in the coding and interpretive processes. I begin that process here.

Personal biases and assumptions. My own professional and personal experiences with the phenomenon of sustaining PIs links my world with the world of study participants. I believe that sharing my own past experiences facilitated participant sharing and enhanced the quality and depth of my exploration of the phenomenon. As an emergency nurse for more than 22 of my 26 years of clinical practice, I provided care for colleagues and other healthcare workers who

sustained PIs. In the process of providing care for these individuals, I witnessed a broad range of physical and psychological reactions to these injuries. I have seen nurses readily dismiss their injury as insignificant to the point of non-reporting. I have also seen nurses so distressed that they felt unable to immediately resume normal duties or return to work. Beyond my professional encounters, I personally experienced several PIs over the course of my own career as I provided care to patients.

My last PI occurred in the summer of 1998 and resulted in the outcome most feared by exposed healthcare workers – bloodborne pathogen infection. Due to my injury, I became infected with HIV and HCV. That devastating occurrence signaled the beginning of a life-changing journey that abruptly ended my 26-year career as a front-line nurse and, for some time, transformed my role from caregiver to patient. Together, these experiences provided the basis for my interest in this phenomenon. They also serve as the source of my personal biases and assumptions related to the experience of PIs.

Professional and personal experiences have biased me to believe that such injuries serve as a source of significant psychological distress for many nurses. I also believe that denial is a common coping mechanism utilized by nurses following PIs and that the personal experience and meanings of sustaining PIs is influenced by a number of factors. These include the level of outcome uncertainty and perceived susceptibility to negative health outcomes. I also believe that the experience of PIs can add to nurses' job stress and that social support can mitigate the psychological impact.

My assumptions as researcher include a belief that the experience of sustaining PIs remains relatively common for registered nurses who provide direct care. I also believe that, while not all PIs will be perceived as stressful, there are essential themes and meanings that exist in relation to

the phenomenon of sustaining PIs. Finally, I believe that phenomenological exploration of the lived experience of PIs has resulted in descriptions and interpretations deemed essential to an understanding of the meanings of PIs for nurses – meanings that are grounded in a hermeneutic sense of the relationship between individuals and the world in which they live. Heidegger, a student of Husserl's, used the term *being-in-the-world* to denote what he believed to be the inseparable nature of this relationship and its centrality to the conduct of phenomenological research - that is, "it is not the pure content of human subjectivity that is the focus of a hermeneutic inquiry but, rather, what the individual's narratives imply about what he or she experiences every day" (Lopez & Willis, 2004, p.729). Definition of study terms follows in the next section.

Definition of Terms

1. *Percutaneous injuries* (theoretical definition) are defined as: "injuries through the skin" (National Institute of Occupational Safety and Health [NIOSH], 2004). The operational definition will include all blood-contaminated sharps injuries, including needlesticks.
2. *Registered nurse* (theoretical definition) is the designation given to an individual who is licensed to practice professional nursing, holds ultimate responsibility for direct and indirect nursing care, is a graduate of an approved school for professional nursing, and is currently licensed as a Registered Nurse in the United States (Massachusetts Nurse Practice Act, 1994). The operational definition will refer to an individual study participant who reports being currently licensed and employed as an RN.
3. *Aftermath* (theoretical definition) is the outcome or consequences of an event, especially as they relate to an individual (WordNet, n.d.). The operational definition includes narratives

provided by registered nurses related to personal consequences and coping in the time following their experience of sustaining a percutaneous injury.

4. *Lived experience* (theoretical definition) refers to a reciprocal relationship between person and environment (Munhall, 2007) - a way of being or experiencing the everyday world which is grasped reflectively as something past. It is the “starting point and focus of human science” (van Manen, 1990). The operational definition is a participant’s expression, captured through audiotaped recording and verbatim transcription of descriptive narrative or text, of reflective (looking back) re-living and objectification of something meaningful in his or her human experience in the world.

5. *Meanings* (theoretical definition) are an individual’s socially-constructed interpretations of experience expressed through: “thoughts, emotions, feelings, statements, motives, metaphors, examples, behaviors, appearances and concealments, voiced and nonvoiced language” (Munhall, 2007, p.198). The operational definition is the voiced and unvoiced responses of registered nurses describing their experiences of percutaneous injuries and their aftermath.

6. *Existential lifeworlds* (theoretical definition) are the themes or structures associated with ways of existing or “being-in-the-world “as immediately experienced in everyday life (Munhall, 2007; van Manen, 1990). The operational definition in this study includes the four lifeworld themes or guiding framework provided by van Manen (1990) which includes: embodiment; space; time; and, relationship.

Summary

As illustrated in the discussion within this chapter, the problem of PIs remains a significant concern for healthcare workers across the US. Little is currently known in relation to the nature of the lived experience or meanings associated with sustaining PIs. Registered nurses are

particularly vulnerable to these injuries and were, therefore, the healthcare worker group targeted for participation in this study. A hermeneutic phenomenological approach was used to explore and understand the lived experience, meanings and aftermath of the phenomenon of sustaining PIs for registered nurses. Van Manen's organizing framework of existential lifeworlds was utilized to guide reflection throughout the processes of data collection, data analysis, and organization of findings.

Chapter 2

Review of the Literature

In this chapter, literature concerning nursing's ethical obligation to provide care that serves the best interest of patients and society, as well as the epidemiology, antecedents and consequences of PIs is reviewed and synthesized. An expanded review of relevant literature in relation to study findings was also undertaken as data were collected and analyzed.

Nursing's Duty to Care for the Profession

According to Nursing's Social Policy Statement (ANA, 1995), nursing is described as "an essential part of the society from which it has grown and within which it continues to evolve" (p.2). Derived from this societal obligation, it is reasonable to presume nursing also owes a duty to society to promote access to responsible and informed care by members of its own discipline. Vital to fulfilling our societal obligation and consistent with the purpose of this study is pursuit of knowledge that will promote and safeguard nurses' own health and safety. The implications of this are two-fold: that nurses must care for themselves in order to optimally care for others, and nurses who don't address their own health care needs are likely to ultimately find themselves in need of care.

Additional support for the profession's obligation to care for its own members is provided by the most recent version of the ANA Code of Ethics. The Code speaks to the moral nature of this consideration in its fifth provision, which reads: "The nurse owes the same duties to self as others, including the responsibility to preserve integrity and safety, to maintain competence, and to continue personal and professional growth" (ANA, 2001a, p.18). The concept of *moral self-respect* described within this provision refers to nurses' obligation to extend the same respect and dignity to oneself as to others. Provision six describes the nurse's duty to establish, maintain,

and improve healthcare environments and conditions of employment. Provision 7 (ANA, 2001a, p.22) speaks clearly to nurses' duty to advance the profession by participating in political activities that foster work environments and actively contribute "to the body of knowledge supporting and advancing nursing practice." Such activities promote the well-being of individuals by facilitating self-care within the profession. Collectively, these goals and values articulate the profession's moral obligation to care for the health and safety needs of its members and to be politically active in assuring those needs are met. The next section identifies existing data sources relative to the epidemiology of PIs.

Percutaneous Injuries

Existing surveillance systems. Epidemiological trends reported in the literature related to PIs among US healthcare workers are fairly imprecise and extrapolated by the CDC based on findings from four PI surveillance systems – The Exposure Prevention Information Network (EPINet), the CDC National Surveillance System for Healthcare Workers (NaSH), the Automated Safety Incident Surveillance and Tracking System (ASSISTS), and the Massachusetts Sharps Injury Surveillance System (MSISS).

EPINet, established in 1991 by Dr. Janine Jagger at the International Healthcare Worker Safety Center located at the University of Virginia, was the first system designed to collect PI data and to provide healthcare institutions with a standardized method for monitoring percutaneous injuries and contacts with blood and other body fluids (International Healthcare Worker Safety Center, 2007).

The CDC developed NaSH in 1995 and has been systematically collecting baseline information on injuries and exposed healthcare workers since that time in an effort to prevent occupational exposures and infections. NaSH also collects data from healthcare worker surveys

to assess underreporting of injuries. In the time since it was established, approximately 80 healthcare facilities in 28 states have participated in data collection (Grytdal, 2005).

The ASISTS system, developed by the Veteran's Health Administration has been tracking and managing data on all occupational injuries, including PIs, since 1998. The MSISS was developed in 2001 by the Massachusetts Department of Public Health (MDPH) following passage of state legislation that mandated annual reporting of PIs by approximately 100 MDPH-licensed hospitals. Both the MSISS and ASISTS surveillance programs mandate PI reporting by all facilities within their networks. The EPINet and NaSH systems involve collaboration with healthcare facilities within their networks that volunteer to participate (Grytdal, 2005).

Concerns have been raised regarding reliability of current PI data given the voluntary nature of participation in two of the four contributing databases, geographic restrictions in all but the ASISTS system, significant underreporting estimates – widely ranging from 30 to 90 percent (CDC, 2005a; Doebbeling et al., 2003; Greene et al., 1998; Jagger, Hunt, Brand-Elnaggar & Pearson, 1988; Rosenstock, 2002; Roy & Robillard, 1995; Tandberg, Stewart & Doezema, 1991) – and limited variability in hospital size within the EPINet and NaSH reporting networks.

Of the more than 1500 hospital network members utilizing the EPINet standardized tracking system, only 70 contribute to aggregate PI data collection (International Healthcare Worker Safety Center, 2007). EPINet hospitals are concentrated in the southeast and northwest and tend to be smaller than NaSH hospitals – with an average of 315 beds compared to 592 in NaSH hospitals, which are more scattered with a number located in the northeast (Perry & Jagger, 2003). Overall, most data reporting is provided by large, urban hospitals (Grytdal, 2005). Regardless, combined data from these two sources provide much of the evidence for current

national estimates of PI incidence and other relevant epidemiological descriptors provided by the CDC.

Epidemiology of percutaneous injuries.

Injury incidence. Prior to passage of the federal Needlestick Safety and Prevention Act (NSPA) in 2000, the CDC estimate of the number of PIs among US healthcare workers – based on 1997 and 1998 EPINet and NaSH data – ranged between 600,000 to 800,000 annually (Jeffress, 2000; Perry, 2000). Of those, approximately 385,000 PIs are estimated to occur annually in hospital settings (CDC, 2004). A more recent report in which corrections were made for underreporting and needle product market penetration suggests the number of PIs sustained annually in US hospitals could be as high as 503,000 (Perry & Jagger, 2003).

More timely estimates of the national PI incidence have not been offered by the CDC in the years following passage of the NSPA in 2000. Since that time, only two reports have been published – both based on data involving 45 to 48 healthcare facilities in the EPINet network– to suggest more recent trends in relation to PI injury rates. Findings from these studies, although limited in their generalizability, suggest that although there was a decline in the overall number of injuries between 2001 and 2003, there has been a negligible decline in the overall annual PI rate among EPINet network facilities (Perry, Parker & Jagger, 2003; Perry, Parker & Jagger, 2005).

Nature of PIs among healthcare workers. Most recent data concerning the nature of PIs among healthcare workers include information regarding occupational group incidence, injury-associated settings and procedures, and types of devices involved. Between 2000 and 2004, more than 37,000 PIs were reported to the four surveillance systems (Grytdal, 2005). The descriptive statistics that follow are based on analyses of these collective injuries as well as

analyses of CDC NaSH data collected in continuous years between 1995 and 2003, or combined CDC NaSH and MSISS data.

Nurses comprise the occupational group who most frequently report PIs, although underreporting rates vary considerably according to occupational group and appear highest among physicians (Perry & Jagger, 2003). Based on combined data from four surveillance systems, nurses – which include both RNs and LPNs – reported the vast majority of injuries (41 percent), followed by physicians (25 percent), and technicians (18 percent). With the exception of experience level, there are no published demographic data to further describe the registered nurse population who sustain PIs. Nurse demographic data categories typically include only the area of clinical practice (e.g. OR, ED, ICU) and level of education, which distinguishes only between registered nurses, licensed practical nurses and nurses' aides.

Several studies indicate generally that physicians are less likely to report PIs than nurses and emergency medical technicians (EPINet, 1997; Perry & Jagger, 2003; Tandberg et al., 1991). However, the CDC found that while nurses were more likely to report injuries than surgeons, they were less likely to report than other types of physicians (CDC, 1999). EPINet and NaSH place overall estimates of the under-reporting rate for PIs between 55 percent and 39 percent, respectively (CDC, n.d.; Perry, 2000).

A number of reasons have been cited as to why exposed individuals may not report PIs – they may not perceive that the injury or source patient places them at significant risk. They may cope by denying susceptibility to diseases to which they have potentially been exposed, or they may have concerns about job security or the time involved in injury follow-up (Tandberg et al., 1991). It is also conceivable that they lack information and proper training regarding appropriate

reporting procedures. In addition, the reporting procedures themselves may be inadequate. Under-reporting is an important consideration when interpreting sharps injury surveillance data.

Analyses of the collective surveillance data of 37,000 injuries reported between 2000 and 2004 to the EPINet, NaSH, ASSISTS and MSISS systems indicate the greatest proportion of injuries occurred in operating or procedure rooms (36 percent) and inpatient floors (28 percent). Nine percent of PIs were sustained in intensive care units and 7 percent occurred in emergency departments and outpatient areas (Grytdal, 2005).

CDC NaSH data collected from 23 continuously reporting hospitals indicate that 4,750 hollow-bore PIs – injuries with the highest potential for bloodborne pathogen transmission – occurred between 2000 and 2003 (Grytdal, 2005). During that same time period, an 8.2 percent decrease in the rate of hollow-bore PIs was observed (from 13.6 PIs per staffed bed in 2000 to 12.5 per staffed bed in 2003 (Grytdal, 2005).

Among those reported injuries, a substantial increase in injuries attributed to hollow-bore safety needle devices was noted (from 13 percent to 37 percent) – not a surprising finding given the increased market penetration of safety needles in the time since Congressional passage of the NSPA in 2000. Examination of circumstances surrounding injuries caused by hollow-bore safety needle devices indicate that 36 percent occurred before activation of the safety feature was appropriate, while over one-third of injuries associated with safer devices occurred due to lack of activation or other improper use of the safety device. Overall, hollow-bore needles, including hypodermic needles or syringes, accounted for 53 percent and 29 percent, respectively, of all PIs collectively reported to the four surveillance systems from 2000 to 2004 (Grytdal, 2005).

Aggregate NaSH data for the period between June of 1995 and December of 2001 indicate that six devices were responsible for 80 percent of the 13,731 PIs reported, including: disposable

syringes (32 percent), suture needles (19 percent), winged steel needles (12 percent), scalpel blades (7 percent), intravenous catheter stylets (6 percent), and phlebotomy needles (3 percent).

Aggregate MDPH data findings based on the analysis of 3,133 PIs reported during 2006 are consistent with NaSH findings. In Massachusetts in 2006, nurses were the most frequent reporter of PIs (37 percent). Hollow-bore needles accounted for 56 percent of all reported injuries, and operating and procedure rooms combined accounted for the greatest number of PIs (44 percent) – almost three-quarters of those injuries occurred in operating rooms. In-patient units accounted for the next largest number (24 percent) of reported injuries (Massachusetts Department of Public Health, 2009).

According to surveillance system data, devices associated with use in percutaneous blood drawing, suturing, and administering injections accounted for 52 percent of all reported PIs (Grytdal, 2005). Characterizing the risk of injury related to specific procedures based on these same data, however, was difficult since nearly one-quarter of all reported injuries occurred while using devices for purposes that were categorized as “other or unknown”. Further categorization of circumstances based on NaSH and MSISS data provided additional information regarding when injuries occurred in relation to phase of device use: 44 percent occurred while the device was in use, 37 percent of reported injuries were sustained immediately after device use, and 14 percent took place during or after disposal (Grytdal, 2005).

Injury preventability. Much attention has been paid to the preventable nature of a significant proportion of these injuries. The preventable nature of an exposure is also likely to be an important consideration for the individual who experiences an injury. Depending on the circumstances surrounding the event and the degree to which the individual views the injury as

preventable, the experience may elicit feelings of anger, guilt, or even embarrassment for the individual involved.

Analysis of CDC NaSH surveillance data collected on 1,130 PIs reported between 2000 and 2003 identified a number of factors believed to contribute to injury prevention. In this analysis, PIs were classified by the CDC as preventable if it was determined that: “a needle was used unnecessarily; a safety feature was used improperly; a safer needle device alternative was available; a safer work practice could have prevented the needlestick injury; or a device was disposed of improperly” (Grytdal, 2005, p. 4). Injuries caused by patient factors such as sudden movement were classified as non-preventable.

Of the 1,130 PIs in the CDC NaSH database for the period between 2000 and 2003, 61 percent of them were characterized as preventable. Among those injuries, 22 percent of injuries involving a conventional device were categorized as preventable because a safer device was available. Both the total number and rate of preventable injuries decreased between 2000 to 2003 – from 8.6 preventable injuries per 100 staffed beds in 2000 to 7.4 preventable injuries per 100 staffed beds in 2003 (Grytdal, 2005). These reductions were attributed, in large part, to a decrease in the unnecessary use of needles as well as conventional needles, and fewer reported incidents of improper needle disposal. A more comprehensive analysis of the NaSH dataset involving 11,625 PIs reported between 1995 and 2004 categorized 64 percent of injuries as preventable, and 18% as non-preventable (CDC, n.d.).

Bloodborne pathogen transmission risk and treatment. Prospective studies data (CDC, 2001) provide the evidence for estimation of the average transmission risk of bloodborne pathogens following PIs. Estimates of average risk for HIV, HBV, and HCV transmission based on these data are 0.3 percent, 6-30 percent (in non-vaccinated healthcare workers), and 1.8

percent, respectively. Based on findings from one case-control study of healthcare workers (33 case patients and 665 controls) with occupational exposure to HIV-infected blood, significant risk factors for seroconversion were identified as: (1) deep injury; (2) injury with a device visibly contaminated with blood from the source patient; (3) procedures involving placement of a needle directly into an artery or vein; and (4) exposure to blood from a source patient who died from AIDS within the following two months (Cardo et al., 1997). Another analysis of national case surveillance data through 2001 indicated 88 percent of occupationally-acquired infections were due to PIs, and that 11 percent of source patients had asymptomatic HIV infection (Do, 2003).

Injury Antecedents and Consequences

Injury antecedents. There has been little research to-date conducted on antecedent or consequent factors in relation to PIs. Antecedent risk factors can be categorized generally as either person or organizational characteristics. Person risk factors or antecedents for injury identified in the research literature include: (1) years of experience (Clarke, 2007; Clarke, Rockett, Sloane & Aiken, 2002a; Smith & Leggat, 2005); (2) fatigue, and working more hours (Clarke, 2007; Clarke, Sloane & Aiken, 2002b; Fisman, Harris, Rubin, Sorock & Mittleman, 2007; Fisman, Harris, Sorock & Mittleman, 2003; Ilhan, Durukan, Aras, Türkcüoğlu & Aygün, 2006); (3) rushing, anger and distraction (Fisman, et al., 2003); and (4) needle recapping (Aiken, Sloane & Klocinski, 1997; Clarke, et al., 2002a), a dangerous practice that still persists despite longstanding CDC-warnings advising against it.

Organizational factors also appear to provide an important context for occupational injury and, with the exception of one nurse staffing study (Clarke, 2007), have been associated with increased risk of PI including: (1) inadequate levels of nurse staffing (Clarke, et al., 2002a; Clarke, et al., 2002b; Lundstrom, Pugliese, Bartley, Cox & Guither, 2002; and (2) professional

practice environment (Aiken, et al., 1997; Clarke, et al., 2002b; Gershon et al., 2000). Two additional antecedent factors that have been identified in the literature: (1) working with an uncooperative patient (Fisman, et al., 2003); and (2) frequency of sharps handling (Clarke, 2007; Doebbeling et al., 2003) are less easily categorized.

Person factors. In one retrospective study of 1075 shift reports involving 960 nurses over a two-month period, prior PIs and less than five years of experience were identified as predictors of future injuries (Clarke, et al., 2002a). Clarke (2007) also analyzed surveys collected in 1999 from more than 11,000 staff nurses from 188 Pennsylvania general acute care hospitals and found that, after controlling for other characteristics, nurses with less than five years of experience had a significantly higher risk of injury. In the same study, staff nurse experience aggregated at the hospital level was not associated with higher risk of injury. In their analysis of survey data from a convenience sample of 274 Australian nursing students, Smith and Leggat (2005) attributed high PI incidence to clinical inexperience and insufficient training.

More attention has been paid in recent years to the influence of fatigue and number of work hours as predictors of PIs. One multi-center study, utilizing a case-crossover design to allow differentiation between brief, transient exposures and acute events, identified an association between increased risk of injury when workers were fatigued, angry, rushing, and distracted (Fisman, et al., 2003). The same study also identified a trend towards increased risk of PI when working with an uncooperative patient or as part of a team that was short-staffed. In another study involving interviews with 350 healthcare workers from five academic medical centers in the US and Canada, fatigue and longer working hours were also associated with a three-fold increase in PIs among medical students (Fisman, et al., 2007). In a cross-sectional survey of 449 nurses working in a Turkish hospital in 2005, 80 percent of participants reported having

sustained a PI at some point during their career, with 68 percent experiencing an injury within the previous 12 months. Factors significantly associated with an increased incidence of PI included age of 24 years or less, four or less years of nursing experience, specialty practice in surgical or intensive care units, and working more than 8 consecutive hours per day (Ilhan, et al., 2006).

Organizational factors. In an effort to identify organizational characteristics associated with an increased risk of PIs, one study was conducted involving collection of prospective data from 960 nurses and retrospective data from 732 nurses who worked on 40 inpatient units in 20 general hospitals located in 11 US cities with high AIDS prevalence (Aiken, et al., 1997; Clarke, et al., 2002b). Institutional comparisons were made with results from a matched group of 10 hospitals in the same geographic areas that did not have specialized AIDS units. Data analysis was performed to assess for any association between organizational characteristics and incidence of needlesticks. Findings demonstrated a 3-fold increase in likelihood of PI and near misses among nurses who worked on units with lower staffing, less adequate resources, and lower levels of nurse leadership and support.

In another 1998 study involving surveys of 2287 nurses employed in 22 US hospitals, the relationship between staffing, organizational climate, and nurse and patient outcomes, including PIs was examined (Clarke, et al., 2002a). Study participants had an average of 11 years of nursing experience. Almost half the nurses in the sample reported having experienced at least one PI in their career, with approximately 9 percent reporting an injury in the previous year. Study findings demonstrated 50 percent to two-fold increases in the likelihood of PIs or near misses among nurses employed by organizations with poor organizational climates and inadequate staffing levels based on patient workloads. A more recent study involving

retrospective analysis of survey data from over 11,000 nurses employed in hospitals throughout Pennsylvania in 1999, however, failed to demonstrate any association between PIs and nurse staffing levels (Clarke, 2007). Study findings did indicate, however, that nurses working in positive working environments did experience a one-third lower likelihood of being injured.

Tool development to measure hospital safety climate with respect to activities designed to prevent bloodborne pathogen exposure has been previously undertaken (Gershon et al., 2000). Questionnaire development and testing involving a stratified sample of 789 hospital-based health care workers from a large, urban medical center led to the eventual development of a 20-item hospital safety climate scale extracted through factor analysis from 46 safety scale items. The 20-question scale measures six separate dimensions considered essential elements of an overall hospital safety culture.

One integrated review was conducted to examine organizational factors that positively influenced the health, safety and well-being of health care workers (Lundstrom, et al., 2002). Based on a review of the literature and adapted from previously described work (Gershon et al., 2000), the authors identified six organizational dimensions that consistently contributed to hospital safety climates and better outcomes among workers and patients. Identified factors included: demonstrated support for safety programs by members of senior management; lack of barriers to safe work practices; worksite cleanliness and orderliness; good communication and minimal conflict among staff; safety-related feedback and training; and availability of protective equipment and engineering controls in the workplace.

Two additional PI antecedent factors have been identified based a mail survey of a stratified, randomized sample of different occupational health care worker groups. (Doebbeling, et al., 1997). The purpose of the study was to accurately assess PI rates within different occupational

groups, and to collect data related to numbers of solid versus hollow-bore needle injuries. Based on data collected from over 2900 participants, PIs were positively associated with frequency of sharps handling and inversely related to compliance with routine standard precautions.

Healthcare worker injury consequences.

Infection rates. As of December 2006, 57 US healthcare workers have been documented as having occupationally-acquired AIDS or HIV (CDC, 2007). In the same period, CDC estimated another 140 possible cases of occupationally-acquired AIDS/HIV occurred among healthcare workers. The top four reported occupational groups include nurses (24 documented, 35 possible), clinical laboratory workers (16 documented, 17 possible), non-surgical physicians (6 documented, 12 possible), and non-clinical laboratory technicians (3 documented). The remaining 8 documented HIV transmissions among health care workers involve two housekeeper or maintenance workers, two surgical technicians, one morgue technician, one health care aide, one respiratory therapist and one dialysis technician. No newly-documented cases and one new case of possible occupational transmission of AIDS/HIV have been documented among healthcare workers since 2001.

Recommendations for routine HBV vaccination were issued by CDC in 1982. Based on CDC national hepatitis surveillance, approximately 500 healthcare workers became infected with HBV in 1997 – a 95 percent decline from 17,000 new infections estimated in 1983. The far-reaching decline in HBV infections was attributed to widespread HBV vaccination and implementation of standard precautions (CDC, 2006).

The actual number of healthcare workers who have occupationally-acquired HCV is unknown. Of the total annual number of newly-acquired HCV infections (which declined from

112,000 in 1991 to 38,000 in 1997), 2 to 4 percent have been in health care workers occupationally exposed to blood (Rosenstock, 2002).

Experience-related distress. Data on psychological and attitudinal consequences of PIs is limited. A review of the literature revealed several studies as well as published anecdotal reports of known exposures to HIV-positive and other high-risk patients which indicate heightened psychological stress response among exposed workers (Armstrong, et al., 1995; Badacsonyi, 2001; Gershon et al., 2000; Henry et al., 1990; Hills & Wilkes, 2003; Howsepian, 1998; Newton, 1995; Seibert, 2003; Shalo, 2007; Treloar et al., 1995; Wilmont, 2009; Worthington et al., 2003; Worthington et al., 2006). Findings from only three studies were found to relate to worker perceptions and experiences following bloodborne exposures or PIs not defined as high-risk (Gershon et al., 2000; Smailes, Hayre, Hind & Yassi, 2005; Sohn, Kim, Kim & Han, 2006). A phenomenological approach was utilized in only one of the studies identified in the literature review (Newton, 1995).

Two case reports summarize the development of post-traumatic stress disorder (PTSD) after a percutaneous exposure to an HIV-infected individual. In one report, the author described a case of chronic post-traumatic stress disorder experienced by a physician's assistant as the direct result of a needlestick that originated from a source patient with HIV (Howsepian, 1998). The other case involved a report of post-traumatic stress disorder in a prison worker who had been bitten by an HIV-positive inmate (Geller, 1989).

Armstrong et al. (1995) conducted a retrospective chart review for 22 healthcare workers who sought treatment in an Employee Assistance Program (EAP) for troubling stress reactions following an occupational exposure to HIV. Of the 18 workers whose initial EAP visit information was available, all expressed worry about becoming infected as a result of the

exposure. Seventeen of the 18 workers reported intrusive thoughts about the exposure event and difficulty concentrating. Fifteen described difficulty falling and staying asleep and anger towards the patient and institution; some expressed emotional numbing and some had nightmares. Many workers described attempts to avoid thoughts, feelings or reminders of the event and perceived an indifference to the event by colleagues and significant others.

Henry et al (1990) conducted long-term follow-up interviews and testing (average time from exposure to interview and testing was 19.5 months) of 20 healthcare workers who had experienced significant exposures involving 15 PIs and 5 mucosal exposures to HIV-infected patients. Despite negative follow-up assay and polymerase chain reaction (PCR) test results for all study participants, 35 percent reported persistent moderate distress, 25 percent reported a significant impact on sexual relations, and 30 percent reported quitting their jobs as a direct result of their exposure.

Findings from two studies (Hills & Wilkes, 2003; Newton, 1995) involving occupational exposures characterized as high-risk identified a perception of abandonment following the injury that was shared by many of the nurse participants. Levels of concern and reporting patterns in one study were linked to risk perception and perceived lack of support by colleagues (Hills & Wilkes, 2003). Newton (1995) reported a wide variation in the intensity and duration of the emotional impact among study participants who experienced high-risk PIs. Fear was reportedly experienced by all participants to some degree following their high-risk exposure. However, the nature of the fear changed based on the duration of time post-exposure. Thirty-five percent of all participants described their reaction to the exposure as concerned to very concerned.

Survey and open-ended question follow-up in a study involving 65 Johns Hopkins' employees who reported recent body fluid or blood exposures revealed that 53 percent reported

feelings of anxiety, 18 percent reported insomnia, 13 percent reported depression, and 10 percent reported loss of appetite, sleepiness and frequent crying (Gershon et al., 2000). Many of the exposed workers perceived a lack of social support from nurse managers and colleagues during a lengthy period of follow-up testing and reported never having adequate closure to the incident. A number of study participants also stated the incident caused them to rethink their careers.

A prospective, multi-center study of over 1000 healthcare workers conducted by British Columbia researchers (Smailes et al., 2005) indicated that men were more likely than women to seek treatment following blood or body fluid exposures. In addition, healthcare workers' perceived level of distress or fear of contracting HBV or HCV was found to be inversely related to age and directly related to years of experience and the perceived likelihood of contracting a bloodborne pathogen. Findings from a retrospective survey conducted to examine incidence of PIs and associated psychological symptoms among Korean healthcare workers indicated that PI-exposed workers experienced significantly higher levels of anxiety and depression than workers who did not experience PIs (Sohn et al., 2006).

There is some evidence in the literature to suggest social support may play a role in mitigating the psychological consequences associated with PIs. Using a phenomenological approach, Newton (1995) interviewed ten nurses to gain a better understanding of the lived experience of nurses following high risk PIs. All study participants described an initial emotional response to their injury and a subsequent need for informational and social support throughout their experience. Expressions of support perceived as most helpful in assisting with coping were characterized as validation, compassion, caring, and physical presence.

Gershon analyzed data from 65 health care workers who completed a mailed survey and answered open-ended questions following reported blood/body fluid exposures. A number of

participants spoke about the perceived lack of social support as contributing to their dissatisfaction with post-exposure care. Another study that explored the experience of 104 Australian nurses following blood/fluid exposures also included collection and analysis of responses to several open-ended questions (Hills & Wilkes, 2003). Many study participants described the need for counseling and reassurance as routine part of their post-exposure care.

Summary

Literature relevant to the experience of PI was reviewed. Much of the existing literature came from public health, infectious disease, occupational/environmental health, and nursing disciplines. Past scientific exploration of PIs has been largely focused on identifying epidemiologic trends. Case reports have provided a limited amount of qualitative description.

Based on an extensive review, it appears only one prior phenomenological exploration of the experience of PIs among health care workers has been conducted. Little is known about the lived experience and meanings of these injuries, despite the scope and significant nature of their impact. Additional research is needed to inform our understanding of these injuries in order to improve the care for nurses and other health care workers who experience PIs.

Chapter 3

Methodology

Methods used to carry out this study are outlined in this chapter. The proposed design, sample, setting, data collection methods and data analysis processes are described. A phenomenological approach was utilized to uncover the essential themes and meanings of the phenomenon in this inquiry. Descriptions and meanings of the experience were obtained through face-to-face, semi-structured interviews conducted with individual participants. All interviews were audio-recorded and transcribed verbatim, and any identifiers connecting dialogue with participants were eliminated. Analysis of transcripts occurred at the individual level in an effort to identify themes and meanings and across participants to detect similarities and differences and identify essential themes and meanings. The study design, including philosophical assumptions of the specific phenomenological approach I have followed, is presented in the next section.

Study Design

Philosophy & methods of hermeneutic phenomenology. A hermeneutic or interpretive phenomenological approach was used to carry out this study. Phenomenology is, in its broadest sense, a philosophy. Phenomenology originates from the work of Husserl, who believed consciousness – the immediate experience of the world through sensory awareness (Husserl, 1927) – was the only real means by which human beings had access to the world. Husserl's philosophy gave rise to a phenomenological inquiry approach grounded in his belief that it was possible to study or know essential features or essences of the lifeworld based on first person description of experience as objects are presented in the consciousness of a subject. Such knowledge is conditional, however, upon suspension of prior knowledge, experience and context.

Key to Husserl's philosophy is the concept of phenomenological reduction, in which understanding is derived from immediate, pre-reflective consciousness of phenomenon. Naive description emerges without judgment or reflection. Objects are reduced to their primeval form – what is immediate and closest to our consciousness (Dowling, 2007). Phenomenological intuiting, the process of coming to know the phenomenon as it shows itself through naive description, is at the heart of phenomenological reduction (van Manen, 1990).

The most basic characterization of phenomenological research is that conscious knowing always begins in the lifeworld – the world encompassed in immediate experience and the natural attitude of everyday life (van Manen, 1990). It was Husserl's contention that the lived experience is understood in our immediate pre-reflective consciousness – without resorting to interpretations and as free as possible from cultural context (Dowling, 2007).

The hermeneutic tradition of phenomenology emerged from Heidegger, a student of Husserl who challenged, and modified Husserl's phenomenological perspective. Beyond the epistemological goal of phenomenology as envisioned by Husserl, Heidegger's focus is on the ontological world and concerned with the search for the essential themes and meanings of the lived experience – those essentials or universals without which the thing cannot exist (Dowling, 2007). Heideggerian phenomenology represents a pursuit of an understanding of the nature of human existence and experience – of being-in-the-world – against the background of an understanding of the nature of “the *logos* of *other*, the *whole*, the *communal*, or the *social*” (van Manen, 1990, p. 7).

In Heideggerian philosophy, humans are already part of the world in which they find themselves. Meanings are first considered in relation to what it is to be a person in the world, rather than simply in relation to what humans consciously know or perceive (Leonard, 1989).

This ontologic phenomenological focus is centered on the relationship of the person – or *being* – in relation to the world, in direct contrast to Husserl’s predominantly epistemological focus. According to Lopez and Willis (2004), Heideggerian phenomenology addresses the relationship of subjective human experiences embracing social, cultural, and political contexts.

In Heidegger’s view, the world has been revealed *a priori*, meaning humans do not ordinarily concern themselves with the everyday nature of what already exists as a set of cultural relationships, language and social practices (van Manen, 1990). Individual human beings both shape the world, and are shaped by the world, in the non-reflective taking up of meanings, linguistic skills and social practices by which things become evident (van Manen, 1990).

Another integral concept of the human science of phenomenology – sometimes referred to as the *phenomenological attitude* – is authenticity (Willis, 2007). Authenticity is about embracing the ultimate possibility of our existence as being, irrespective of external pressures and in contrast to other relations in the surrounding, material world. Authenticity relates to the idea that we are responsible for our own choices and honors the presence and being of self and others in relation to awareness of non-being. Making decisions in the present with authenticity, according to the phenomenological attitude, requires a conscious effort along with personal reflection on a projected future, specifically death (Willis, 2007). In other words, consciousness of non-being allows us to make more authentic choices in the present. More often than not, humans are inauthentic (Staehler, 2007).

Language is central in this perspective as “it both articulates and makes things show up for us” (Leonard, 1989, p.43). It also requires the researcher to consider, not only the smallest units of data from individual participants, but also larger units of data, as language, essential themes, and meanings unfold across narratives. Munhall (2007) places emphasis on the need to remain

true to the language and intent of participants throughout the process of phenomenological inquiry. While what shows up as figural (stands out on the surface) is meaningful, there are other aspects of the world that remain hidden and are revealed only in the back and forth process of the part-whole dialectic known as the hermeneutic circle.

The hermeneutic process, also known as the hermeneutic circle, in some respects, parallels the process human beings use to understand their world – using a circular process of trial and error, questioning and rectifying, and shared meanings to interpret what is happening (Cohen, Kahn & Steeves, 2000). In hermeneutic phenomenology, participant description and texts are used to elicit understanding and meanings in relation to a phenomenon. The interpretive process involves movement between parts and the whole of experience and back and forth over and over again to enhance the depth of engagement with and understanding of texts (Annells, 1996). Processes of data collection and analysis, therefore, become entwined in this back and forth process as tentative understandings of the data are sought and refined over time. These understandings are incorporated along with my experience to ultimately derive essential meanings of the phenomenon. That is,, as examples of being’s potentiality and as possible instances of a phenomenon. In deriving meanings as a phenomenological researcher, one can apprehend what the participant held as fore in awareness.

Phenomenology, as method, seeks thick and insightful description, reflection, and interpretation that ultimately elucidate essential themes and meanings of a particular lived experience. Lived experience, in Heidegger’s view, is the process of everyday being-in-the-world and is expressed through text from which meanings emerge with back and forth movement between the part and the whole – the process through which the researcher comes “to understand the possibilities revealed in the text” (van Manen, 1990, p.180). Stated another way, “a universal

or essence may only be intuited or grasped through a study of the particulars or instances as they are encountered in lived experience” (van Manen, 1990, p.10). In separating what is figural from what is ground – or background – the hermeneutic circle allows the researcher to come to a deeper understanding of essential themes and meanings in relation to a phenomenon.

Existential phenomenology seeks to describe how phenomena present themselves through consciousness in lived experience or existence (van Manen, 1990). The existential nature of the human lifeworld is sought out in relation to a phenomenon – in other words, what makes it what it is (van Manen, 1990). Van Manen has presented four fundamental existential themes as guides for reflection in elucidating the essentials of everyday situations and experiences. These four existentials are lived body (corporeality), lived human relation (relationality), lived time (temporality), and lived space (spatiality) (van Manen, 1990). Van Manen’s organizing framework was used throughout this study as a reflective guide during processes of the type of questions asked in the interview data collection, data analysis, and organization of findings.

Phenomenology is judged by me to be the most appropriate approach for capturing, through descriptive expression, the lived experience of PIs and their embedded or hidden meanings for several reasons. First, little is currently known regarding the nature and meanings of this lived experience. Second, the research questions in this study are focused on questions of being: *What are the major themes of the lived experience of percutaneous injury and its aftermath in relation to embodiment, space, time and relationship as perceived by registered nurses who have had the experience?* and, *What are the subjective meanings that can be interpreted about the human experience of percutaneous injury and its aftermath as perceived by registered nurses who have had the experience?*

According to Cohen, Kahn & Steeves (2000), meanings attributed to experiences help

identify human needs and a better understanding of how best to meet those needs.

Phenomenology provides the most effective method for identifying essential themes and meanings associated with the lived experience of PIs. In an effort to reach a clearer understanding of what the common issues, concerns, and meanings are in relation to these injuries, interpretive phenomenology is the most appropriate methodology for generating the knowledge that will assist healthcare providers in meeting the needs of individuals who experience these injuries. Study sample and recruitment strategies are described in the next section.

Recruitment and Sample

For this study, registered nurses employed in pre-identified northeastern states who have sustained a PI in the prior 24 months were sought for participation. An extensive review of the literature failed to provide any evidence to suggest optimal timeframes for accuracy of recall in relation to post-injury data collection. Initially, in the absence of these data, the decision was made to base timeframes for post-injury participation eligibility on the time period traditionally involved in post-injury serial testing. Most typically, serial testing and health outcome evaluation is completed within a period of approximately six months following the injury (CDC, 2005). However, based on difficulty encountered in recruiting nurses utilizing the original strategies, subsequent proposal amendments were approved by the Boston College (BC) IRB that expanded the post-injury study eligibility period from six to 24 months, and allowed dissemination of recruitment materials, including the study ad, to institutional providers around the state granting formal approval.

The study sample was limited to registered nurses in the northeast United States for several reasons. Registered nurses are the healthcare group most frequently impacted by the problem of

PIs and the goal of this study was to gain a better understanding of the experience and meanings of PIs. Variation of the sample based on particular demographic characteristics is not usually recommended in qualitative research unless failure to sample for such variation would impede understanding or invalidate findings, or sampling variation is needed for analytic significance (Sandelowski, 1995). It was my belief, based on the experiential focus of this study, that such sampling variation would not add anything appreciable to study findings. Rather, knowledge and experience related to the study phenomenon constituted the main selection criteria for study participants.

While not statistically representative, I believe such sampling is “informationally representative in that data were obtained from persons who could stand for other persons with similar characteristics” (Sandelowski, 1995, p.181). Nurse participants were recruited from both urban and community care settings based largely on the potential for variation in occupational health resources and diversity of patient populations that could add a different context to the experience of PIs and their aftermath.

According to both Sandelowski (1995) and Patton (2002), all types of sampling in qualitative research can be categorized as purposeful. In Patton’s view (2002), the power of purposeful sampling is derived from selecting information-rich cases for study. Several strategies for purposeful recruitment were identified for this study. One involved a solicitation by letter (Appendix A) of injured nurse referrals through mailings to occupational health nurses who belonged to professional nursing organizations or were employed by institutions within New Hampshire, Rhode Island, Vermont or Massachusetts. Registered nurses who presented for care following a PI were informally provided with information about the study by occupational health nurses aware of the study. Any nurse who expressed interest in learning more about the study

was provided with my contact information and asked to contact me directly by email or phone.

In addition, study recruitment notices (Appendix B) were placed on websites of targeted affiliates of national nursing organizations. Permission was sought from local, state and/or NE affiliates of four nursing organizations – the American Nurses Association, the Association of Operating Room Nurses, Emergency Nurses Association, and American Association of Critical Care Nurses – to allow placement of study recruitment notices on organizational websites and/or circulation through membership email distribution lists. These particular organizations were targeted based on frequency of sharps use among these nurse practice groups, which carries with it a greater likelihood of PI. Study recruitment ads were also placed in organizational and area nursing newsletters of organizations granting approval.

Among the 15 strategies Patton (2002) lists for purposefully selecting information-rich cases is snowball or chain sampling, which was used as a strategy for participant recruitment in this study. I asked nurse participants to share information with any other nurse they believed might be eligible to participate in the study. In the event a referral was made by a study participant, contact was initiated by potential participants.

Once individuals made contact with me to express interest in the study, details regarding study purpose and preliminary details of participation were provided by phone, and eligibility screening was conducted. Preliminary information was obtained via phone and recorded on a screening log (Appendix C), including initial contact date, recruitment source, date of injury, and study eligibility. Once the individual was determined to be eligible and continued interest in study participation was expressed, a face-to-face meeting was scheduled at a mutually agreed-upon time, and in a private, quiet location away from the workplace. First names of potential participants, a preferred contact number (for use only in the event meeting dates need to be

changed), and the meeting date and place were recorded on the screening log, which was maintained throughout the study in a secure location.

Individual interviews were conducted until data saturation for major themes and meanings. All individual participants were interviewed once, although participants were encouraged to contact me in the event they wished to share additional thoughts or experiences following their face-to-face interview. The number of actual contacts with the phenomenon required to reach data saturation in this study was nine.

Inclusion and exclusion criteria. Study participants included registered nurses from Rhode Island, New Hampshire, Vermont or Massachusetts who sustained occupationally-acquired PIs within the previous 24 months. Exclusion criteria included nurses who, prior to the time of their injury, had a history of anxiety or depression requiring medical treatment or psychiatric care.

Protection of human subjects. Prior to study initiation, approval was obtained from the BC IRB following submission of a successfully defended proposal. Once the IRB approval process was completed, approval was also sought from targeted nursing organizations and institutional provider sites prior to distribution of any study recruitment materials for staff dissemination, website posting and/or email distribution.

Patient confidentiality was strictly maintained throughout the study. Guidelines set forth by Health Insurance Portability and Accountability Act (HIPAA) and by the Office for Protection from Research Risks for the Protection of Human Rights was observed at all times. Personal identities of all individuals who responded to recruitment notices and requested additional information on the study was kept strictly confidential. All caller ID numbers, phone and email messages were deleted immediately following completion of the interview process with the investigator. Preliminary information entered onto the screening log was kept secure in locked

cabinet throughout the study period. Once the study was completed, personal identifiers (phone number and first name) were redacted from the screening log. All computer data was password protected and de-identified through the use of personally-selected pseudonyms chosen by participants. Only I and faculty advisors had access to screening logs, demographic data sheets and raw data, which were securely locked in a cabinet and will be destroyed 7 years after study completion. All audiotapes and hardcopies of signed consents were also kept in a locked cabinet. Audiotapes will be cut up/destroyed following publication of the first manuscript.

Before written consent was obtained at the time of the face-to-face interview, all participants had time to read and assimilate information regarding the study as well as the opportunity to have all questions answered. Verbal and written assurances were made to all potential participants regarding efforts to protect confidentiality. As part of the consent process, permission was obtained to conduct interviews of each participant, to audiotape the interviews, to take field notes and to use any personal notes or journals related to their experience.

Participants were provided with a hardcopy of the consent form (Appendix D) that included the name and contact information for the investigator and her faculty advisor at Boston College. All participants were advised of their right to withdraw from the study at any time.

The potential does exist for emotional distress to occur in this study with the revisiting of a potentially traumatic event. Hadjistavropoulos and Smythe (2001) describe situations like this as somewhat complicated since the risk might involve a negative mood state. An ethical obligation existed, therefore, in this study for not only assuring adequate resources were in place to provide support for participants at no cost, but also for continually monitoring for signs of distress and to avoid putting pressure on participants – either directly or indirectly.

All study participants were made aware of this potential harm as part of the consent process.

Although minimal distress, stress or risk related to the interviews was anticipated based on my experience with a prior pilot study (Mittleman, 2006), arrangements were made, prior to study approval, for the establishment of a provider consultant network that included experienced psychiatric nurse practitioners licensed within the four pre-designated New England states. Each nurse practitioner consultant agreed to conduct an initial assessment and provide a session of counseling for study participants, as well as referrals for follow-up care as needed.

Prior to each interview, participants were made aware of availability of free professional mental health evaluation and counseling resources. During each interview, participants were observed for signs of emotional or physical distress. Evidence of emotional distress or other unusual occurrences were noted by me using a field note approach. In addition, time was allowed during the interview process for participants to talk about distressing topics. Over the course of the study, it did not become necessary to make any mental health referrals, based on my assessment or participant request. Study setting and instruments are described in the next two sections.

Study Setting

This study included nurse participants who lived or worked within the four pre-designated states in the northeast region of the US. Interviews were conducted at times and locations that were mutually agreed upon and convenient for participants. Work settings were not used as interview locations, given the potential for breach of participant confidentiality and absence of prior approval for use of employment settings. Use of home settings were also discouraged as interview locations unless complete privacy could be assured for study participants. If privacy within the home could not be assured and a participant still insisted on selecting a home setting as the interview location - despite being fully informed of investigator concerns – I deferred to

the participant's preference. Ideally, given the potentially sensitive nature of the interview topics, preferred settings were quiet, private and free from distractions or interruptions.

Study Instruments

Interviewing, in phenomenology, is a collaborative, interactive, contextually-bound process between two people. Denzin & Lincoln (1994) believe that in trying to understand *the other*, we come to better understand ourselves. It is the openness of the researcher that helps create openness in the participant. The outcome of the interview process is, as stated by Denzin & Lincoln (1994), as much a product of social dynamic as it is of accurate accounts and replies. The main instrument used for this study was, therefore, the researcher. As such, I did reveal my own history of PI with study participants.

A number of interview guides and data collection forms were utilized to help participant narratives to unfold, including a semi-structured interview guide (Appendix E). Semi-structured interviews are often used in situations where it is not clear whether there will be more than one opportunity to interview a participant (Bernard, 2000), as was the case in this study. The interview guide provided a written list of broad questions and topics that were covered during the interview process and helped fill-in missing pieces as the lived experience narrative unfolded.

Since the phenomenon had already occurred, a retrospective hermeneutic approach was used. Narratives of the experience were solicited by questions that turned the participant's attention to the experience and asked them to talk about it. The guide developed by the investigator consisted of broad, open-ended questions like: *"Tell me about yourself; Tell me about your practice environment;"* and, *"Can you describe a typical day before your injury?"* As the interviews progressed, more specific questions related to the PI experience will include: *"Tell me about the day of your injury; When you think about your actual injury, what stands out?; What*

does your experience mean to you?” ; and, “How has your injury affected you?”

Probing questions such as, *“Could you give me an example of that?”* and, *“Can you elaborate more on that?”* were used to clarify my understanding of participant responses and meaning. Reflective statements such as, *“It sounds like you are saying that... Is that correct?”* were also used to confirm accurate interpretation of participant responses and narratives and provide them with an opportunity to correct misinterpretations.

A demographic questionnaire was also administered (see Appendix F) which utilized the participant-selected pseudonym. Data collected on this form included: participant age, current relationship status, a rating of the participant’s current support system, highest completed level of education, current practice area, number of years of RN experience, type of care setting in which this injury occurred, existence of prior needlestick injuries, and whether they were reported. Completion of the demographic questionnaire took less than five minutes.

Investigator contact sheets (Appendix G) were also completed immediately following each interview. These sheets were utilized to keep notes relevant to each participant interview such as dominant issues or themes, or additional questions to consider. Separate field notes were taken at each contact to record any aspects of the interview that could not be discerned from the transcript of the audiotape, including participant observations. Field notes and contact sheets served as a record of the investigator’s experience of the inquiry and, as such, provided additional opportunities or insights for investigator reflection or self-evaluation. Data collection procedures are outlined in the following section.

Data Collection Procedures

The initial phone contact between the potential participant and myself was used to provide an overview of the study, including an explanation of the interview procedures and a description of

my interest in studying the phenomenon. The interview, transcription and analytic procedures were also briefly described for each participant.

In an effort to avoid any perception of pressure to participate, eligible nurses expressing interest in the study were offered additional time following the initial contact to consider whether or not they would like to be a part of the study. Once a participant confirmed interest, a subsequent face-to-face contact was scheduled at a mutually agreed upon time and place. At this meeting, participant questions were answered, willingness to participate in the study was confirmed, and the consent form was reviewed and signed. Following signed consent, the demographic questionnaire was completed and the face-to-face interview was conducted at this meeting. Scheduled interviews lasted between 60 to 90 minutes each.

Oral narratives were obtained through face-to-face semi-structured interviews with participants. The interview guide was used as a basic framework only. No additional interviews were scheduled. With agreement from participants, phone follow-up was conducted to follow-up on themes, topics and meanings emerging from initial interviews. Participants were also encouraged to feel free to contact me as needed to discuss issues not previously shared relative to the aftermath of the experience. The goal of all interviews with participants was to produce thick description that best captured each experience in its fullest and richest complexity.

Data Analysis

Van Manen's existential framework. According to van Manen (1990, p. 36), "the aim of phenomenology is to transform lived experience into a textual expression of its essence – in such a way that the effect of the text is at once a reflexive re-living and a reflective approximation of something meaningful...". The goal of each step in these processes of data collection, analysis and interpretation is to produce authentic and rich representations of participant description,

experiences, and meanings. To accomplish that, it is necessary to stay close and open to participant language and to search through the data to find expression of meanings. For van Manen (1990), determination of themes in phenomenological analysis is simply a means for reaching a clearer understanding of the structures of the lived experience. As Munhall reminds us: “People do not talk in themes; we *impose themes* on their ‘language’ ” (Munhall, 2007, p. 179).

As mentioned previously, van Manen’s (1990) existential framework was used as a guide for phenomenological inquiry in relation to the phenomenon of sustaining PIs. The first activity in van Manen’s phenomenological method (1990) is that of *turning to the nature of the lived experience*. The initial step – orienting to the phenomenon – began with my involvement with this issue on both a personal and public policy level. Following my own injury, I became immersed in processes of self reflection and heightened awareness regarding the personal impact of my injury. I also became purposefully engaged in a process of increasing my own knowledge and awareness of factors that contribute to incidence of PIs and serve as barriers to prevention.

As a nurse leader and president of the Massachusetts’ affiliate of the American Nurses Association (ANA) at the time of my injury, I injected myself into the public policy debate, not only within my home state, but in states around the country where policy reform related to needlestick injury prevention was in its early stages. I began to speak to nurses in a wide range of venues – most often at the request of leaders from other ANA state affiliates. That process proved mutually beneficial and sensitized me to shared concerns being raised by hundreds of other nurses who had also experienced a needlestick – or remained fearful of the potential for injury and exposure to bloodborne pathogens. In the years since my injury, I have remained engaged in educational and policy activities related to needlestick injury prevention at a state,

regional and national level. Ultimately, the desire to be able to contribute to knowledge of these injuries led me to pursue doctoral education.

Formulation of my research questions – and the decision to utilize phenomenological inquiry, emerged as a natural extension of my inability to locate research that provides any description of the experience or communicates a sense of understanding of the meanings of the phenomenon of sustaining PIs. My belief remains that a better understanding of the human responses and meanings associated with these injuries and the extent to which they impact nurses' lives will have important implications for post-exposure care.

Step three in van Manen's method relates to explication of investigator presuppositions and bias. This involves a dynamic process of reflection, self-awareness, and reflexivity facilitated by writing and discussions with peers, faculty, and nurses who have experienced PIs in the process of providing care to patients. A compilation of personal assumptions and biases, based on my own experiences and reflections, have been summarized in Chapter 1.

Existential investigation, the second activity in van Manen's method, involves two steps – exploring the phenomenon and consulting phenomenological literature. This also remains an ongoing process beginning with my personal experience as the starting point. As recommended by van Manen, etymological sources for key words and phrases were traced and meaning sources of key words and themes were explored. In addition, experiential descriptions reflective of participants' words as well as descriptions derived through a range of literary and artistic sources were sought.

Phenomenological reflection involves engagement of the researcher in understanding and utilizing phenomenological literature and conducting thematic analysis across all participant lifeworld descriptions. A theme might represent the point or focus of a section of the text. As

themes are determined, experiential structures that make up the experience are identified along with isolation of evocative thematic statements. The most difficult aspect of phenomenological research, according to van Manen (1990), is differentiating between incidental and essential themes.

Essential themes are those that make a phenomenon what it is, and, without which, the phenomenon would not be (Merleau-Ponty, 1962). In order to generate and verify the essential nature of a theme in relation to a phenomenon, the method of free imaginative variation is commonly used (van Manen, 1990). In this method, it is necessary to ask: “Is this phenomenon still the same if we imaginatively change or delete this item from the phenomenon?” (van Manen, 1990, p. 107).

The four lifeworld structures presented as guides for reflection by van Manen (1990) include: lived body (corporeality), lived human relation (relationality), lived time (temporality), and lived space (spatiality) (van Manen, 1990). While, according to van Manen, it is possible to differentiate one from another, they cannot be separated, as all are inextricably linked in the intricate unity and meanings of lived experience. One always calls forth the others in the study of phenomenon.

Lived body (corporeality) refers to our physicality or bodily presence in the world – and how, through our physical presence, we reveal or conceal things about ourselves. *Lived space* (spatiality) is “felt space” (van Manen, 1990, p. 102) – which relates to the effect our landscape or world has on the meanings of lived experience. *Lived time* (temporality) refers to our temporal subjectivity or way of being in the world – not clock time. Van Manen (1990) also refers to the temporal dimensions of past, present and future as making up the horizons of an individual’s temporal landscape. The final lifeworld structure is *lived other* or relationality,

which involves moving outside of self in the experience of others.

Phenomenological writing is the fourth and final activity included in van Manen's method (1990). Far more than a mechanical process, writing exists as a mode of discovery for the researcher (Sandelowski, 1998). To make good decisions about what to tell and how to tell it, the researcher must stay close to the data. At a minimum, the goal is a coherent rendering of the results of phenomenological inquiry. At its best, well-written text will have the desired effect of "making us 'see' something in a manner that enriches our understanding of everyday life experience" (van Manen, 1997, p.345). Words, thematic statements, varied examples, metaphors and images were used throughout the writing and rewriting processes to help clarify and bring readers as close as possible to the experience of the phenomenon and its interpretation. Exceptions will be included in the write-up of findings.

Mechanics of interpretive analysis. Collection and analysis of data occurred as concurrent processes. Audiotaped interviews were transcribed verbatim and accuracy of all interview transcripts were checked against the audiotape for accuracy. In addition to language, attention was paid to voice inflection and pauses. The process of data analysis began by reading all the data several times as they were generated in transcripts, and throughout the analytic phases to achieve immersion and obtain a sense of the whole before beginning the process of coding.

Decontextualization of data. Individual case analysis were used to help me understand aspects of the experience that occurred as part of a pattern formed by the confluence of meaning within individual accounts (Ayers, Kavanaugh & Knafl, 2003). A line-by-line coding process was used to identify, sort, label, and isolate core aspects of each participant's experience. Codes and matrices were used to capture common experiences *across cases*, not individual uniqueness

within cases. Codes and themes were generated for each individual interview and then, in a recontextualization process, compared and contrasted across all other interviews.

Recontextualization of data. The part-whole dialectic of the hermeneutic process was used to link parts to the whole. Recontextualization involved reintegration of data into themes that combined units of like meaning from multiple participants (Ayers et al., 2003). While considered key elements in data analysis, themes are ingredients derived from individual descriptions, not the end product of qualitative research (Ayers et al., 2003). They are developed into generalizations built from central aspects of participant experiences within and across individual narratives. Significant across-case thematic codes were identified along with meanings or attribution derived by the researcher and supporting statements. Throughout the interpretive process, collaborative discussions with dissertation committee members experienced in the qualitative research method and philosophy were used to help generate and validate insights and understandings of the text. A discussion of study rigor follows in the next section.

Study Rigor

Assurance of scientific rigor is essential, regardless of research method. Munhall (2007) summarizes the most critical ethical obligation in research as describing the experiences of others in the most faithful or trustworthy way possible. Munhall offers her own view of what she believes should compel researchers to meet that ethical obligation – that “rigor is founded on a profound reverence for human beings and their experiences” (2007, p. 501). To enhance rigor in this study, dissertation committee members experienced in the qualitative research method and philosophy – expert peer reviewers – were involved in reading, coding and analyzing the data independently to increase trustworthiness of the data. I then collaborated with these expert peer reviewers to reach consensus on data interpretation and findings.

Validity in qualitative inquiry is less about methodology than about enriching our understanding through data that are sound and findings that are credible. Whittemore, Chase and Mandle (2001) describe in detail the various transformations the concept of validity has undergone in qualitative research. Lincoln and Guba (1985) proposed four overarching principles which remain the gold standard for establishing validity in qualitative research and represent the validity criteria used to guide ethical conduct of this study – credibility, dependability, transferability and confirmability (Whittemore et al., 2001). A variety of strategies were employed to strengthen the validity of this study based on these four criteria.

Also termed truth-value (Krefting, 1991), credibility is based on the discovery of human experiences as they are lived and perceived. Credibility represents confidence in the truth of the data and its interpretation – the overriding goal of qualitative research (Lincoln & Guba, 1985). There are two key aspects to credibility: carrying out the research in a way that enhances believability of findings (design & process); and taking steps to demonstrate credibility to readers (who judge quality of findings).

Credibility involves using strategies that help the researcher remain sensitive and open to all possibilities of participant description and meanings in relation to the study phenomenon. Strategies used in the interviewing process to establish credibility included the use of open-ended questions, exploring, focusing, seeking clarification of, and reflecting participant responses. Data triangulation was another credibility-enhancing strategy that involved engaging in reading and reflecting on other data sources such as literature, field notes, and peer review feedback and collaboration. Maintaining personal notes and phenomenological reflection also contributed to study credibility by enhancing my self-awareness and assisting with unbiased openness to the data. Reflexivity, open communication and engagement with participants throughout the

interview process, and staying close to the data also enhanced study credibility. In-vivo verbatim statements from transcribed audio-taped data have been used to support and validate findings. Member checking was also used, as often as possible, to confirm my faithfulness to the data and validate interpretation of individual data themes and meanings.

Dependability, the second standard of validity, relates to consistency of findings and the ability to confirm the reliability of findings by providing auditable data trails. Data trails in this study included: (1) field notes; (2) participant contact summary sheets; (3) personal notes; (4) transcribed interviews; and, (5) coding schemes and matrices. Field notes included written observations compiled during individual interviews that helped construct and reconstruct interactions occurring between myself and participants. Participant contact summary sheets (Appendix D), as recommended by Miles and Huberman (1994), were used to record and track issues, themes, and questions from each interview deemed important or requiring additional follow-up. Notes were maintained to promote deeper levels of personal reflection, reflexivity and awareness throughout conduct of the study.

De-identified transcribed interview data have been maintained in a secure location for availability for other interested investigators. Use of coding schemes and matrices allow tracing of decision-making as codes emerged and changed along with emerging understanding and meanings. These data have been shared in their entirety with the dissertation chair and other committee members throughout the process of expert reviewer collaboration in relation to data collection, reflection, and interpretation.

Transferability refers to the ability to apply or transfer findings to other populations or settings. While appropriate for quantitative research in relation to generalizability of findings, that criterion for applicability or transferability is less appropriate to the goals of qualitative

research. Krefting (1991) offers a second perspective on applicability based on the work of Guba and Lincoln, who argued that as long as findings presented offer sufficient descriptive data, this criterion is met. The findings of this study are not generalizable, but rather describe participants' lived experience in relation to the phenomenon. Dense description of research methods, along with code-recoding procedures and peer review of findings with the goal of reaching consensus, represent strategies used to promote dependability. Findings and methods are described in detail in order to meet this criterion of rigor.

Confirmability, the final validity criterion related to researcher confidence in study findings, is linked to neutrality in relation to data, and is achieved when truth-value is achieved (Krefting, 1991). Bracketing, reflexivity, and criticality were employed throughout conduct of the study to maximize my awareness and openness to the data. Study limitations follow.

Study Limitations

Study findings are limited by the depth and breath of the interview data provided by study participants. It must also be considered possible that the themes and meanings identified are unique to study participants.

Chapter 4

Results

This chapter presents findings of the lived experience of PIs among registered nurses. Face-to-face interviews about 9 PI experiences were conducted with 8 registered nurse participants. Common themes identified as the essential structure and meanings of the experience and aftermath of PIs were revealed through a reflective part-whole dialectic process of phenomenological data analysis disclosed in Chapter 3. The depictions below represent a reconstitution of the participant text to highlight the nurses' experiences in an evocative and poignant manner.

Sample and Injury Demographic Characteristics

Nurse participants in the study are all female and are referred to by pseudonyms of their choosing. All registered nurse participants spoke about experiencing their injury in the context of varying circumstances, settings, work and social culture, and previous life and career experience. At the time interviews were conducted, participants ranged in age from 28 to 59 years. Two nurse participants are married and five are single, including one widow. One participant is divorced. Four out of eight participants rated their current social support system as very supportive. Three rated it as somewhat supportive, and one participant rated it as neither supportive nor unsupportive. Four nurses reported their highest educational level as bachelor degrees. Three had earned a masters degree, and one had a PhD. Three of the study participants are nurse practitioners. Demographic characteristics of the sample are summarized in Table 1 (Appendix H).

Injuries occurred in a variety of practice settings. Five were sustained within an urban hospital setting, one in a hospital-based clinic, and three within non-hospital-based community

settings. Length of RN experience ranged from 1 to 33 years and practice specialties included: wound care; primary care; hematology-oncology; emergency care; medical-surgical nursing; OR nursing; homeless population care; and ICU burn care. Time lapses from PI to interview date ranged from periods of under six months (4), six to 12 months (3), and 22 to 23 months (2).

Details surrounding the nature of percutaneous injuries differed significantly, but all injuries involved contaminated devices. Five injuries were sustained with hollow bore needles. Three occurred after a subcutaneous injection with small gauge needles. One involved a 21-gauge needle used for administration of local anesthetic, and the other occurred during the removal of a 16-gauge phlebotomy needle. Of the four remaining injuries, scalpels caused two injuries, one was caused by a staple, and one involved a lancet. According to participant reports, blood was immediately visible at all injury sites except one. Five participants described their puncture wounds as relatively deep. At the time the injury occurred, five of the nine source patients were already known to be HIV and/or hepatitis C positive. All injuries were reported immediately and post-exposure care was sought and provided to each study participant. In the section that follows, essential themes, dimensions and thematic statements will be presented and discussed.

Phenomenological Reflection

Phenomenology is directed towards the identification of essential themes or structures that make the phenomenon what it is, and, without which, it would not be. To that end, throughout this process, I kept one key question close: What do the data reveal in relation to the research questions? The research questions were: 1. What are the major themes of the lived experience of percutaneous injury and its aftermath in relation to embodiment, space, time and relationship as perceived by registered nurses who have had the experience? and 2. What are the subjective meanings that can be interpreted about the human experience of percutaneous injury and its

aftermath as perceived by registered nurses who have had the experience? To validate the essence of the phenomenon as identified, follow-up contact was made with four of the study participants who agreed that the conceptualization of the lived experience captured their experience.

Essential Themes, Dimensions, and Supporting Statements

Three essential themes emerged as the findings of this study and capture the essence of the phenomenon of PIs and its aftermath as experienced among registered nurses. These essential themes were interpreted from the data and include dimensions that are substantiated by supporting statements from participants. Figure 1 summarizes these essential themes and dimensions using a temporal logic that depicts the PI and its aftermath.

Figure 1. Themes and dimensions

The Essence of PI

Theme 1: Being shocked: The potential of a serious or life-threatening infection – the essence and meaning of the lived experience of percutaneous injury. Being shocked with the potential of infection included three dimensions:

- A. Responding viscerally and emotionally
- B. Acting on the body (as object) to reduce contamination
- C. Feeling the urgency for immediate care

Meanings of PI and its Aftermath

Theme 2: Needing to know it's going to be okay – the initial meaning of living in the aftermath of percutaneous injury that includes risk assessment and seeking post-exposure care and reassurance with respect to the potential health threat. *Needing to know* included two dimensions:

- A. Assessing risk
- B. Seeking post-exposure intervention and caring responses from others

Theme 3: Sensing vulnerability – a secondary meaning of the aftermath of percutaneous injury that is associated with needing to know and reflects susceptibility, both real and perceived, to disruption of health and interpersonal relationships. *Sensing vulnerability* included three dimensions:

- A. Facing the fragility of health
- B. Distinguishing supporting vs. non-supportive relationships
- C. Being vigilant as necessity

The first essential theme, *being shocked: the potential of a serious or life-threatening infection*, was identified as the core essence and the primary mode of living with the sudden occurrence of percutaneous injury. Three dimensions, *responding viscerally and emotionally, acting on the body to reduce contamination*, and *feeling the urgency for immediate care* comprise the essence of the phenomenon as gleaned from the participants in this study. The meanings of the human experience were captured in two other essential themes, *needing to know it's going to be okay* and *sensing vulnerability*, identified as the initial and secondary modes of living in the aftermath of PI.

Two dimensions, *assessing risk*, and *seeking post exposure care and caring responses from others*, were identified as initial dimensions of living in the aftermath. The secondary mode of living in the aftermath was comprised of three dimensions that included: *facing the fragility of health, distinguishing supportive vs. non-supportive relationships*, and *being vigilant as necessity*. Together, these three essential themes and their dimensions reveal the meanings of PI and its aftermath. Those meanings, *being shocked*, *needing to know it's going to be okay* and *sensing vulnerability*, represent the human experience of percutaneous injury and its aftermath for the registered nurses in this study.

Essence of PI – Being shocked: The potential of a serious or life-threatening infection.

Every nurse who spoke with me of her PI experience over a period of 18 months in the study described an initial reaction to her bodily injury that reflected shock, anxiety, distress and a sudden loss of equilibrium. In each case, there was a sense of being thrown into a new world situation that placed the nurse outside of her normal state of existence. The first identified theme, *being shocked*, captures the essence and primary mode of being-in-the-world with the actual PI as it occurred. *Being shocked* evoked a response that was visceral and emotional.

During the PI, participants were literally thrown into a situation in which their present life world narrowed and constricted to a focus on the body. The nurse's body, once passed over in her awareness during the practice of nursing, became figural during the PI. The participants – in seeing the cut, seeing the blood oozing from their bodies, etc – were moved to act on the body to reduce contamination. Knowing the potential for a serious or life-threatening situation, they projected themselves into a future state of affairs in which their existence was threatened. Existential concerns relative to embodiment and the threat of non-being became paramount in the experience of PIs, as participants simultaneously considered the range of possible health outcomes. The threat of serious illness was present in the moment and led all to feel and act on the urgency for immediate care.

Responding viscerally and emotionally. Upon realizing an injury had occurred, nurses' awareness suddenly contracted to focus on a bleeding finger, thumb, or hand. A simultaneous, almost instinctive consciousness of the threat posed by the injury was manifest in language that revealed fear, shock, denial, and emotional distress. Participants used evocative terms that reflected the centrality of embodiment in their recounting of the incidents: "I was stuck by a ten blade; I just stood there; I saw the blood; heart pounding; not being able to squeeze your finger hard enough; had an adrenaline rush, etc. In all of these experiences, there are numerous examples of embodiment. A description of nurse participants and evocative statements follow.

Hillary is a married woman in her fifties without children. She chose nursing as a second career about 14 years ago and perceives nursing as a calling. She currently works in an ambulatory hematology oncology setting affiliated with a community hospital. Hillary recounted her private horror in the moment she realized her thumb had been stuck by a 16-gauge phlebotomy needle:

I just remember - oh shit... shit, shit, shit - and I said that in my mind. I don't even know if I verbalized it, but I was behind the patient's left shoulder when I pulled my glove off and I saw what I had done....

Hillary's description of the moment reveals that she not only blamed herself for her injury, but she also internalized her initial reaction. Keeping the patient unaware of her injury meant there was no outside acknowledgement of what had just happened. This shielded her from compounding the distress she felt by inviting another's reaction, but also protected her, too.

Vanessa is a single woman in her late twenties without children. She worked as an EMT until five years ago, when she became a registered nurse. Stuck by a staple while caring for a critically-ill burn patient, Vanessa worried not only about the possibility of bloodborne, but also skin infection, remembering having previously been infected with MRSA from a job-related exposure. Vanessa described her thoughts in the moment she realized her finger had been stuck and was bleeding:

Oh crap. I had other injuries at work, but never with patient contact, nothing that involved any blood contact or anything, but because our patients are also highly infectious for MRSA and VRE and pseudomonas and aspergillus and all these other wonderful other things that grow, I was worried that obviously if the staple got through and I was bleeding although no blood was coming up through the glove, that there was still, we treat everything as very dirty.

In reflecting on the moment of her injury, Vanessa recognized in an emotional manner that, for the first time in her career as a nurse, patient contact could pose a threat to her physical health. The sharpness of the device and patient's blood made the threat possible along with

the patient's past and lifestyle. Suddenly, Vanessa realized that a patient's world was colliding with her own in a very personal way. She spoke about that realization:

Before we kind of, not necessarily joked about his bachelor lifestyle and his multiple partners and stuff, but we were like: Oh well, which girlfriend's coming in today?

Somebody would come in and they'd say: "Oh, I'm his girlfriend" and we were like: "Oh, yes, have you talked to the other girlfriend that just left?" Now his lifestyle affected me personally whereas before it was just the patient's visitors that were coming in.

In one moment, the patient's lifestyle, sexual history, drug history, and medical history were intermingled and entwined with Vanessa's health and future in a way that it had not happened previously. The distance she had previously experienced from his lifestyle had suddenly shifted from merely background knowledge to figural within her consciousness and being.

Two nurses were initially unsure they had been stuck, including Sandy, a 45 year-old single woman who had been a registered nurse for about one year. For the past 8 months she has worked with high-risk populations in a medical-surgical setting. Sandy shared feeling unsure, then stunned with the sudden realization she had been stuck:

I had given it [the injection] to her and I was like... Oh, what was that? I had gloves on and everything and for a brief moment I was like... no. For a brief moment I said: No, that wasn't, but then I went out and took my glove off and I saw a little blood there.

Not unlike other participants, Sandy's first reaction was to question the likelihood an injury could have occurred. Maria, a 60 year-old widow who worked as a community health nurse caring for homeless populations, had a similar reaction. Maria spoke about two injuries she sustained within a 15-month period. She recalled the first injury and the shock and surprise she felt: "I was stunned. It happened so unexpectedly. I thought I had been so careful with the

lancet.” Maria’s second exposure occurred when a protective sheath failed to lock after she administered a TB test to another staff member who was employed as a drug counselor. Maria reported: “I wasn’t sure at first that I had been stuck. Once I saw all the blood, I have to say I became alarmed and really concerned. Especially knowing what the staff person’s job was at the facility.”

Cindy, an NP in her forties who specializes in wound assessment and care, was in the process of debriding a diabetic foot ulcer on a patient with hepatitis C when the scalpel slipped and cut her left hand. She described alarm and fear as she looked down at her thumb:

I actually remember I had a sudden sinking feeling. I’m not an alarmist, but when it first happened, it was pretty frightening. After a couple of minutes, I collected myself. I figured it’s all right, we’ll work this through and I tried to keep myself from freaking out, even though I knew his hep C status. I just... I don’t know... I always... that’s just me. After the initial shock, I tried to remain calm and take care of my patient after I made sure that I wasn’t in any immediate danger.... But I knew as soon as that sharp went into my thumb that I was in serious trouble just because of the depth of it and something clicked inside me and said this is not just a simple cut.

Cindy’s thoughts immediately focused on her thumb, where the scalpel had punctured the intact physical boundary between her own body and that of the patient. Her embodied reaction was visceral – no longer with intact physical boundaries, she described a “sinking feeling.”

Subsequent efforts to ‘collect herself’ revealed an attempt to get herself together – to overcome the feeling of being shattered and out of control and regain composure.

Cookie is a 52 year-old single woman who has been an RN for over 30 years and has worked in the same large urban hospital OR for the past 15 years. Her finger was cut by a surgeon’s

scalpel when he suddenly turned in her direction during an emergency incision and drainage (I&D) of an abscess on an HIV and hepatitis C infected patient. Cookie recounted her terrifying experience and her initial inability to absorb or acknowledge what had happened to her:

[was stuck] By a ten blade. And since the patient was fully infected with this abscess on her buttocks, and we also knew her history of HIV and hep C, I broke scrub. Well, for a minute I didn't break scrub. I just stood there and couldn't believe it. The circulating nurse yelled at me: "What did you do? You know she has hepatitis C and HIV. Oh my God" and then I asked for another pair of gloves and I was just going to change the gloves and finish before I broke. It wasn't [registering]. I saw the blood, cut through both pair of gloves and for a minute I just stood there and I was just all ready to finish helping the other person and keep that hand behind my back just so that I could hand it. The case was almost done and he just had to finish packing the wound and the surgery was all over and everyone just stood still and no one said anything to me to like break scrub [or] run to the emergency room and then all of a sudden I had to stop and think for myself. Oh my God, I just got stuck by a blade and I just broke blood and it went through two pairs of gloves.

Not able to fully comprehend the reality of being exposed to such a highly infectious patient, the initial silence in the operating room following her injury only compounded her denial – almost as if not acknowledging it might mean it really hadn't happened. When the silence was finally broken, the first thing she heard was the circulating nurse screaming at her in horror. Cookie's first inclination was to change gloves and finish the case – again denying that her injury was that serious. For some participants, as was the case with Cookie, the moment of injury held a surreal quality – and left them unsure of what had happened, who did what, and even whether an injury

had actually occurred. Cookie further described the surreal nature of her initial gut-wrenching reaction to an incomprehensible exposure:

When they said: “What happened?” I wasn’t really sure at first. I was double gloved and this time I felt like: Did I stick myself? Did he stick me? He’s [the surgeon] not going to let me out of this. He’s not going to speak up. Why isn’t anyone saying: “Break scrub” and then all of a sudden a light bulb came on after about sixty seconds....

Maggie, a divorced mother of three in her fifties, has been an RN for over 30 years and works as an NP in an urban hospital. Like Cookie, Maggie was involved in performing an I&D on a high-risk patient when a needle she was using to inject local anesthetic went through the abscess and into her left hand, which she’d positioned above the infected site. Like other participants, Maggie’s reaction was visceral and immediate. The surreal nature of the experience was manifest in her questioning of reality and her inability to initially make sense of the serious nature of her exposure. Maggie recalled how horrified and panicked she felt when she realized what had happened:

It was just sort of feeling your heart pounding out of your chest, not being able to squeeze your finger hard enough to clean the wound good and sort of going back and forth between: Did that really happen? Or, am I just imagining this? And then almost thinking that I really don’t need to do anything. How bad could it be? I’m rinsing it so good. I was wondering if I was overreacting to be honest.

Like Maggie and Cookie, other participants described wanting to finish what they were doing with the patient – putting themselves back into the comfortable role of provider – and thereby distancing themselves from the threat and fears of their injury by normalizing the situation in the

moment. In their conscious decision to focus back on the patient, they would be able to return to the world that was familiar and within their control, and they would once again be okay.

Sarah, a single woman in her twenties, has been an RN for three years and works as an NP in a primary care setting. Her injury occurred on an infectious disease (ID) unit where care is provided for a predominantly HIV positive population. She recalled the moment and her embodied sense of panic when she realized she was stuck with the same needle she had just used to administer subcutaneous heparin to a high-risk patient:

I said: “Oh shit” and I knew this patient was HIV positive. I knew that she had hep C, but I didn’t know really what the status of either them were. So basically, I said: “Oh shit” and then had an adrenaline rush, but I didn’t think about much else.

Sarah’s awareness, as in the case of the other participants, shifted to her physical injury and the threat conveyed by it. Her constricted focus left no room for competing thoughts at the time.

Acting on the body to reduce contamination. The participants – in seeing the cut, seeing the blood oozing from their bodies, etc – were moved to act on the body to reduce contamination. Participant actions reflected a cognitive, problem-focused coping related to the need to *do something* in the face of a perceived threat. The injured body part became an object representing a portal for the introduction of blood contamination. Participants left what they were doing with the patient and shifted their focus to washing, rinsing, and purging their wounds in order to separate themselves from potentially toxic blood that was not their own – blood that could threaten their health and their existence in the world.

Torn between the frantic need she felt to purge her body of blood from the source patient and stop her own bleeding, Hillary admitted feeling unsure of what she should do following her injury from a large-bore needle:

I pulled my glove off and I saw what I had done and so I grabbed some 2 x 2's, pushed it against my thumb. ...I then walked into the med room where there's a sink and running water and I kept on thinking am I supposed to be milking this? That's what I remember. Is that going to help if I keep on milking it to prevent any cross contamination? Those were my initial thoughts and then I'm saying my God, it's bleeding a lot. I got to stop. I don't remember how I told myself just apply the pressure and make it stop....

Participants moved between rinsing or washing away surface blood and trying to purge the invisible threat – foreign blood that had already penetrated beyond the skin and was possibly carrying invisible pathogens to their own blood. After her stick involving an active intravenous drug user, Maggie vividly remembered: "...not being able to squeeze my finger hard enough to clean the wound good. ...I squeezed the daylights out of the finger...."

Vanessa, a relatively recent graduate experiencing her first PI, recalled being unsure of what steps to follow and recounted washing the area and wiping off the surface blood – almost as if the threat disappeared if blood was no longer visible.

I wash[ed] my hands and put on Cal Stat, not that I knew what that would do, but that was going to do anything and I tried to see if I could wipe [it] off or if it was still bleeding just standing there and then I notified the charge nurse and I put a piece of gauze and a little band-aid on my finger....

Cindy, an NP specializing in wound evaluation and care, described using alcohol to disinfect the deep thumb laceration she had sustained: "I left the room and immediately washed my hands and put alcohol in it and it didn't hurt right away and I put a band aid on it...."

Cookie had been a nurse for over 30 years when her injury occurred, and recalled having to leave the OR abruptly to perform first aid on her finger: [After the injury] "I broke scrub. Rinsed

the wound as good as I could and put pressure on it with gauze. It was bleeding a lot.” Sarah, spoke about being assisted by a nurse colleague after her injury: “We [she and another nurse] went to the nurses’ station and I had taken the glove off at that point and she started... she had gloves on and she started milking the stick....”

All participants spoke in language and tone that pointed to how seriously they perceived their PI experience. Embodiment remained an ongoing theme in *acting to reduce contamination*. The sense of urgency communicated by participants continued as they reported their injuries and sought expert care.

Feeling the urgency for immediate care. Knowing the potential for a serious or life-threatening situation as it unfolded in the present moment of sustaining a PI, nurses projected themselves temporally into a future state of affairs in which their existence was threatened. Embodiment and temporality stand out as central in this dimension of *being shocked*. Aware of their limited ability to attend to their own needs following a bloodborne exposure, participants acted on the urgency they felt for receiving expert care without delay. Participants’ relationality to others emerges here as another centrality in their lived experience as nurses looked beyond themselves to others in their world for support and assistance. Nurses talked about the importance of relationships in approaching others to report their injury, and seeking the support that would allow them to leave their patients and practice areas to seek care for themselves.

Employed on an ambulatory hematology-oncology unit, Hillary sought out her nursing supervisor to formally report and seek care following her injury. She described the actions she took immediately after her injury:

While I had a bunch of 2 x 2’s against the thumb, I went in and told my supervisor. So she came out and she goes: “Oh well,” went through the file cabinet and said: “Here are the

forms” and I said: “But I can’t fill them out, I’m left handed” and she goes: “Alright, I’ll fill them out for you.” So she proceeded to fill them out on my behalf and she asked me questions and I answered them and then she says: “Well, you probably have to go to the hospital” and I said: “Okay.”

Hillary is left feeling alone and helpless after reporting her injury. Not only is she faced with a nurse supervisor who dispassionately and begrudgingly goes through the motions of completing her incident report, but she is also left to fend for herself in finding transportation to the facility’s main campus where the ED was located. Hillary described her struggle to find a way to get to the hospital and the stress it added to an already urgent situation:

Part of the problem with me going to the hospital was we are a one-car family. So I usually get dropped off. So I called home to my husband who wasn’t there. So then I thought: Oh, what am I’m going to do? And that’s so unusual because he works out of the house so nine times out of ten when I need to get in touch with him, I can. So I wasn’t able to get in touch with him. I called a friend, the friend was not home and then I called my mother and at this point, my poor mother is 77 years old and she’s in a panic now, because she knows that I have non-Hodgkins lymphoma. So when I tell her on the telephone that I need to go to the emergency room, would she take me, come pick me up at work, she goes into a panic. So a few minutes go by and I have the paperwork in hand. I walk out to the main road so that I would see my mother when she comes by and probably a good thirty minutes go by of that first hour and I’m thinking ‘uh oh.’

Hillary looked to her nurse supervisor for help and was left feeling abandoned and helpless.

Being on her own to get to the hospital only magnified the panic and urgency she felt with

respect to her need for care. Her fears and anxiety were further compounded by her awareness that precious time was ticking by as she waited for a ride to the ED.

Maria experienced two different PI experiences within a matter of months. Following her first injury, she admits to being unsure about what she needed to do. Despite their apparent ignorance of standard post-exposure guidelines, she described her supervisors as supportive:

I wasn't exactly sure what timeframe for getting to the hospital, but I immediately did tell them. They [supervisors] were [responsive]. They wrote an accident report. Yeah, went right down to ---- and they said: "You can go now or you can go later" and I said: "I'm going now." They said: "Fine." They found somebody to cover for me and I went immediately.

Maria's second injury occurred while she was administering TB tests to staff members. After immediately reporting her injury to the doctor with whom she worked in the clinic, she subsequently paged the administrator to report it to her. She recalled that conversation:

I did tell the doctor who was working in the clinic as a provider and I was the only nurse working at that particular time in the clinic. ...I paged my supervisor, because that clinic did not have a supervisor at the time. So a woman who's the administrator for the organization I work for was on page and I called her and told her what happened. I told her I was the only nurse in the clinic and she said: "Well, at the end of the shift you can go down to ---- or take care of it, whenever, at the end of the day. I said: "No, my understanding is that I need to be seen right now and I think the closest emergency room is ---- and I'd like to go right now" and she didn't put up any objections to it and I printed out an incident report. ...Her response was more casual and I was concerned that she said wait until the end of the day. So I talked to the doctor and I told him I'm going to go over to the

hospital.

Maria faced different responses from the two nursing supervisors after reporting each of her injuries. While apparently not knowledgeable about recommendations related to post-exposure care, the first supervisor supported and facilitated Maria's decision to leave the clinic and go immediately to the ED. While the second supervisor did not raise any objections when Maria insisted on seeking care right away, she communicated a more cavalier attitude towards her injury and seemed more concern about staffing issues than Maria's immediate health and safety.

Vanessa received a much more caring response from her immediate supervisor as she reported her injury:

I told the nurse in charge. She said: "Absolutely, go to Occ Health." She said she'd cover my patient while I was gone and she didn't have an assignment. So that was okay for her and she was an ICU nurse, so that was okay, too. So she did cover my patient while I was gone, which could have been a problem because not all of them are trained for the dialysis, the CVVH that he was on. So she also was trained for that.

Vanessa was fortunate to be able to report to a nurse colleague who not only encouraged her to seek care, but also covered her patient so she could leave immediately. The competence of her nurse-in-charge relative to the complexity of her patient's needs provided additional reassurance for Vanessa as she left the unit. Another peer in the ICU, however, responded much differently to Vanessa's decision to seek immediate care for her injury:

I actually had another nurse that said: "You're not going to go over to Occ Health to do that" and I said:, "Yes, I think I will." She said: "It was just a... it's just a staple" and I told her: "Well, if I was not bleeding under my glove... I mean there was blood" and she said: "Oh, whatever." She's like, "You just want to leave your shift" and I

told her: “No, not really.”

Instead of offering support and understanding, the nurse peer bullies Vanessa about her motives for leaving the unit. Vanessa felt judged and ridiculed, and the need to justify her decision to take care of herself after her injury.

Following her injury, Sandy immediately left her floor to report it and was encouraged to seek care from the ICU attending who was covering. She recalled:

I went right into the nurses’ office and rinsed the wound, told the nurse, the charge nurse and she said: “Okay, we’re going to call the supervisor. We need to do an incident report and I’ll call the doctor” and they said: “Do you want them to come up here?” And I said: “No, let me get off the floor. The doctor could have come up, but I said: “Let me go down there, because that’s where his office is.” At our facility we don’t have doctors on 24 hours.

Given the limited nurse staffing and physician coverage in her facility, it would have been easy for the charge nurse to find excuses to delay her timely access to post-exposure care. Instead, Sandy’s decision to report her injury and seek immediate care was supported and facilitated by everyone she contacted following her injury.

After she was cut by a careless surgeon’s scalpel in the OR while scrubbed in on a case involving an HIV and hepatitis C infected patient, Cookie described having to take the initiative to break scrub and seek care for herself:

The surgeon just stood there, didn’t say anything. It was a resident and I said: “I’m going to break now and I’m going to...” He goes: “Do what you have to do.” It happened so fast. At first, I didn’t know what happened, who did what. I just know that I could overhear the circulator yelling at me. That was overshadowing everything, but it was all of a sudden I said, I realized after a minute that no one else is going to take care of me except for myself

and all of a sudden I realized each and every one is out for themselves first and that you have to take care of yourself, no one else is going to take care of you. No one else is going to stop this and tell you to go right now. [she] Broke scrub. I went to the desk. Not even the other girl [circulating nurse] went to the desk, I went to the desk actually to tell Marsha I just got cut by a scalpel and I need to be relieved. She just picked up the phone and got someone in there and then the next day she called me, because I was crying my eyes out. Yeah, by the time I got in the corridor to walk down to the emergency room by myself, it started to hit me.

It is likely that all the OR staff were also in shock when they realized what had happened to Cookie. Instead of engendering compassion among her co-workers, however, that shock resulted in silent paralysis and callous treatment by other OR staff. It took Cookie a minute to realize she would not be receiving the care or support she needed from co-workers and she surmised ‘everyone is out for themselves first.’ Despite the horrific nature and urgency of her situation, she realized no one else is going to tell her to break scrub and facilitate her to receive the immediate care she needs. Terrified, she left the OR and is left alone to walk to the ED for care. With the exception of the nurse sitting at the desk outside of the OR, not one person was there to support or comfort her. In the matter of moments, her world was transformed into a very lonely and uncaring place.

Maggie recalled the denial she felt about the seriousness of her injury and the ambivalence she felt about upsetting and leaving her patient with the knowledge that she had been injured. She also described the support she received from colleagues for seeking immediate care:

Going back and forth between: Did that really happen? or Am I just imagining this? and then almost thinking that I really don’t need to do anything. How bad could it be? I’m

rinsing it so good. Do I really need to get seen and go through all this? And, you know, telling the patient that I needed to leave the room. I was very torn between his reaction... how I was reacting upsetting him. So one of my colleagues came in immediately and sort of dealt with him and I ended up going over to the non-acute side because that's what everybody made me do. I think if I made my own choice, I might not have done that.

Maggie almost convinced herself she didn't need to report her injury or be seen for care. Not unlike several other participants, she was using denial to cope with an incomprehensible threat. Embodiment was central to Maggie's experience, as the prospect of infected blood entering her body in conjunction with the unequivocal reality check from colleagues, prompted her to take immediate action.

Sarah, who worked on an HIV unit, was also encouraged by colleagues to report and seek care for her injury. She recounted:

I saw that there was a little bit of blood coming up from under the glove and I didn't tell the patient. I put the needle in the sharps container and I came out to the hallway and one of my other fellow nurses was standing out there with her cart and I said: "I just stuck my finger" and she said: "Okay," and we went to the nurses' station and she directed another nurse to get the incident report, filled out the incident report, and I was basically whisked away to the emergency room, because on the night shift, the health services is closed. So they covered the rest of my patients and I just went.

In Sarah's case, the shocking threat of a serious exposure resulted in an almost robotic and passive response from Sarah. Once aware of her injury, caring nurse colleagues directed next steps and assumed control of Sarah, who was 'basically whisked away' immediately to the ED for care.

Initial meaning of PI and its aftermath – Needing to know it’s going to be okay. For participants, *needing to know it’s going to be okay* meant being reassured that the threat to their body would not materialize and that they would be okay. Embodiment remained central to the lived experience. Consciousness expanded beyond the bleeding body part to the circumstances surrounding their injury – to the device involved, to the wound depth and amount of bleeding, and to the source patient whose blood now contaminated their own. Participants asked themselves: What is the likelihood of contracting an infection given what happened and how it happened to their body? How significant was their risk? What about their injury made the risk less worrisome or more significant? What were their options if the injury indeed posed a risk to their body?

Along with embodiment, temporality and relationality became central in the aftermath of the injury. In gauging the likelihood or risk that existed for illness or infection to take hold in their bodies, participants utilized information from a variety of sources. Initially, participants internalized their own assessments of risk and then looked outside themselves to experts and to colleagues for additional information related to their risk. Participants also looked to others for comfort and reassurance to help them deal with frightening circumstances that now threatened their body and even their existence. Nurses sought reassurance from members of their professional community as well as from others within their social networks, both in the form of desperately sought information, and caring responses that demonstrated support and a sincere attempt to understand the difficult nature of this experience.

Assessing risk. The immediate threat felt by participants was visceral, immediate, and emotional. As time provided some ability for participants to step back from the initial shock of injury, they began to think more about what they knew about injury risk relative to the

circumstances of their PI. While not necessarily being familiar with actual post-exposure treatment protocols, participants in this study understood that numerous factors were routinely weighed as part of assessing risk. It was not unusual for a nurse, therefore, even before being seen for her injury, to begin assessing risk based on what she knew about the source patient and her injury. Others provided additional information that informed risk following their PI – the source patient, the expert staff, and colleagues who'd shared a similar experience. In order to feel reassured, they needed more information. Injured nurses looked outside themselves to help put their circumstances and the threat they felt into perspective.

Immediately following her injury, Hillary's thoughts focused on the large gauge of the needle that stuck her, the depth and amount of bleeding from the resulting wound, and getting to the ED for care within three hours in case she needed PEP. She shared her initial thoughts as proxy for perceived risk she spoke about her injury: "A sixteen gauge hollow core needle. [it] immediately it began to bleed. ...and when I pulled the glove off, it was obvious it was just pulsing out." Her anxiety was palpable as she described important minutes ticking away in the time before she actually received care in the ED:

We head down to the hospital and it's the hospital that I actually work for, I'm an employee of, but because we are a free standing facility, I'm not a face that they're familiar with. But I have my badge and when I go into registration, I show them my badge and tell them that I've had a needle stick injury at work and the emergency room tech takes my vital signs and everything, tells me to go sit down in the waiting room and I'm thinking you know, between getting the injury and then filling out the paperwork and then waiting for my mother, my hours.... I've got like five minutes left in my hour and then a few minutes later I hear the triage nurse say: "Oh no, when it's a needle stick injury that is like a level one, it has to be

taken care of immediately.” So the tech then came out and called me out and then brought me into the emergency room and they assigned me to my little room and I was there probably, maybe ten minutes I waited there and then a doc came in....

Hillary’s preoccupation with time represented risk to her – the increased risk of HIV sero-conversion if she needed PEP and didn’t receive it in the optimal time frame following her PI. In the end, the ED physician reassured her, based primarily on the source patient history, that her actual risk was very low and PEP wasn’t needed. Hillary stated: “He told me that based on her [source patient] responses to the questions, he thought that it would be very low risk that I would have contacted AIDS or hepatitis, knowing that I had already had a vaccination for hep B.” And while Hillary expressed some reservations about the intimate nature of the screening questions and doubts related to a patient’s willingness to truthfully share such personal history with a stranger, she did say that her concerns were somewhat allayed by the information provided by the ED physician.

Vanessa found it much more difficult to be reassured in the initial period after her injury. Of particular concern to her was the source patient’s history of promiscuity and prior transfusions. She shared her thoughts about the potential risk posed by his history:

It wasn’t a 90-year old grandmother that’s been married for fifty years that has no obvious history. It was a younger 40 something single male known to be very amorous by his friends that would come in and we’d go: “Oh, does he have a girlfriend?” They’d say: “Yes, he’s got five” or “Yeah, what week is it?” and we had seen a few girls that would come in. He had previous hospitalizations, so there were previous opportunities for why he could have. He had previous blood transfusions and definitely could have been at risk [for infection], including the number we’ve given him. ...I went over to Occupational Health

and then she [the provider] reviewed the risks or percentage of the high risk if he was a known carrier of either the hepatitis or HIV and the fact that he wasn't known....

Vanessa left the clinic somewhat reassured by the information she had been provided. However, because the source patient's HIV status was unknown at the time of her injury, both she and the source patient underwent testing to allay concerns related to risk.

Sandy was working with a high-risk patient infected with HIV and hepatitis C when she was stuck with a subcutaneous needle. She became immediately concerned about her risk, even though the needle involved was small bore. She spoke about a lessening of her fears, based on the risk assessment and reassurance provided by the attending physician who cared for her following her injury:

I met with the Infectious Disease doctor and she told me the likelihood, because it was a sub cue injection and because I was put on the medication immediately, the chances of contracting that would be low, the percentage would be low....

Despite his reassurances that her risk of infection from a sub cue needle was low, the physician made the decision to start Sandy on a PEP regimen that she would continue to take for the next four weeks. The PEP further reduced her likelihood of contracting HIV and provided her with needed reassurance that she would be okay.

Despite reassurances from the occupational health physician that baseline and source testing were unnecessary after her first injury involving a lancet and source patient with a benign history, Maria still insisted that both she and the source patient be tested. For some nurses like Sandy and Hillary, the information they sought and were provided related to the likelihood of transmission risk was extremely reassuring. For others like Maria, it held less import.

Maggie articulated why, in her case and others like Maria's, statistics and facts really didn't matter:

I was scared. I was pretty freaked out... I was pretty freaked out... and you could have told me the statistics until the cows came home. That wasn't going to change anything because I'm like... I can be that one person. It just didn't change anything.

Maggie was speaking about the overpowering and irrational fear that for some participants was associated with their PI. For these participants, fact-based risk estimates failed to reassure. Her intense, emotional reaction made it impossible for her to be step back and be objective about the risk of her exposure. For participants like Maggie, the sudden and shocking nature of the PI experience also involved an unbearable loss of control prompting them to assess their risk. Loss of control over her body, loss of control over the fact that she now faced this reality as a patient – not as a provider – and loss of control over her health outcome all converged in her mind at once.

Maria explained why circumstances surrounding her second injury raised even more apprehension regarding risk for her:

I was aware that he [source patient] was a drug and alcohol counselor and I was also aware that many times people in that role might have had experiences of their own with a history of drug or alcohol use and so that sort of for me caused me to have a higher level of concern as well.

Based on her source patient's history, Maria was, like other nurse participants, assessing her own risk. That fear-based assessment would make it much more difficult for her to be reassured by the occupational health experts who subsequently surmised her risk to be low.

For Cindy, a combination of factors heightened her anxiety and concerns about risk. Her wound was deep and the source patient was HCV positive with an unknown HIV status. She

recalled: “I knew as soon as that sharp went into my thumb that I was in serious trouble just because of the depth of it and something clicked inside me and said this is not just a simple cut.” Even the patient became extremely worried for her upon learning of her exposure. Based on their risk assessment, and not knowing the source patient’s HIV status, occupational health providers immediately offered her PEP. Unlike Maria, however, Cindy declined PEP, stating: “I opted out of it, because I just had this feeling I was going to be okay.” Willing to wait for the source patient’s HIV test results to come back. Her concerns around hepatitis C, however, given her patient’s history, were less casual.

When the reality of her situation finally struck, Cookie could do nothing but assume the worst. She described how she felt:

All of a sudden, I was just like, I felt like all of a sudden my life just appeared in front of Me and that, wow, I just got cut by a blade and the person has full blown AIDS and here I am almost at the height of my career and in a heart beat it can be over. It was only really when I got to the emergency room and everyone treated me with urgency and respect to get me right in the back....

With little ability to initially calm herself or see any reason for optimism, Cookie quickly projected herself into a future in which her being and her livelihood were seriously threatened. She was convinced she would become infected. It was only after she arrived in the ED where she encountered a staff that was straightforward, but caring that she described feeling in any way reassured and hopeful: “They saw the severity and the acuteness of it. It validated what I was really feeling. That it’s a very serious thing.... and [they] said: You’re going to take the medicine and you’re going to be alright....”

Already angry at herself and worried about her exposure to a high-risk patient, Maggie experienced additional distress at the lack of consensus she overheard from ED providers regarding her transmission risk and their apparent confusion over what treatment protocol to follow. She described what her experience was like:

So I remember having some panic at one point where I felt like, Oh my God, it just really hit me, with all the discussion that went on about it and the [sic] unclarity about whether she is a high risk or a moderate risk or a low risk and it took them all some time to come to the common ground there. That kind of bothered me. ...I was just so mad at myself that I put my hand up there. I'm like, I would never do that. Yeah, so real disappointment in myself that after all these years and then to do it with a patient that was, in my mind, very high risk. I mean I thought he was pretty high risk.

The indecision she overheard from her providers only heightened her sense of fear and panic. Instead of being reassured, the argumentative nature of the discussion outside her room only served to undermine her ability to trust or be reassured by their assessment and treatment recommendations. Learning that the source patient refused to undergo testing made Maggie even more anxious and upset about the risk she likely faced:

I remember when they said he didn't want to be tested, I became sort of like angry at this person. Like why wouldn't he want to do that and that's when my anxiety grows, because I'm thinking he doesn't want to do it because he knows his test results.... ...I felt like if he would have tested and I would have known, that could have taken away so much anxiety, but the fact that he wouldn't and I knew he was hepatitis B positive and he was an intravenous drug user. Yeah, I was mad. I was really mad at him.

Maggie's anger at her patient masked her deepening sense of fear and pessimism about the actual risk she faced from her injury. Having access to his test results would have allayed her fears. Instead, she now worried that he was HIV positive.

After her injury, Sarah described her thinking as she tried to rationally weigh what she did and didn't know with respect to her exposure risk:

I knew this patient was HIV positive. I knew that she had hep C, but I didn't know really what the status of either them were and I feel really lucky that I had gone through all the training about needle stick injuries and everything and I said: Okay, it's a low-risk. I know this is low risk, because it was a sub cue needle. I know this is not a high-risk exposure, but I didn't know what the status of her illnesses were.

Sarah was able to step back and look at the total circumstances surrounding her injury. The information she had learned about injuries allowed her to maintain some perspective relative to her risk of becoming infected. What she didn't know about the source patient, however, made it necessary for her to seek out additional information.

Seeking post-exposure intervention and caring responses from others. Embodiment and relationality remain central throughout the period of post-exposure care and intervention. Risk assessments provided the basis upon which occupational health and emergency providers made recommendations relative to testing, treatment, and follow-up for injured nurses. As part of the larger health care community community, participants sought care for their body. The relationship, competence, and compassion with which that care was delivered in the immediate post-injury and follow-up periods left injured nurses with clear and vivid impressions of providers and the overall experience. Participant accounts also made it apparent that the compassion and support offered by other colleagues and significant others transformed their

injury experience. It was, therefore, the post-exposure intervention, as well as the caring responses from others, that helped injured nurses know that they were going to be okay.

Hillary shared what was for her a disturbing encounter in the initial moments after she was placed into a patient room in the ED on the day of her injury:

I was there probably, maybe ten minutes. I waited there and then a doc came in and asked me what had happened, so I explained it to him, and he said: “Well, did you get a draw from the other person?” and I said: “What?” All I’m thinking about was my thumb and I said: “No.” He says: “Well, don’t you have policy and procedure?” I said: “I don’t know. I don’t know about any policy and procedure. I just know about my thumb.” And he proceeded to lecture me.

Rather than paying attention to Hillary’s immediate needs for comfort, reassurance, and caring, the physician added to her distress by focusing his attention on an impersonal and bureaucratic protocol of care. Unaffected by her attempt to bring his attention back to her needs, he followed the protocol – ordering baseline testing and screening the source patient by phone about potential risk behaviors. Hillary recounted the rest of her encounter with the ED physician:

He told me that based on her [source patient] responses to the question, he thought that it would be very low risk that I would have contacted AIDS or hepatitis, knowing that I had already had a vaccination for hep B. So he thought that he would give me all the information for the cocktails and I could think about it. I could either take the pills with me that evening, that afternoon from the emergency room or I could wait until the patient came in, was drawn, they could do the preliminary tests and if anything came back questionable or positive, then I could come back to the emergency room and they would give me the cocktail. So those were my options.

Armed with additional information about the source patient and her options related to intervention, Hillary declined PEP, deciding instead to wait for the test results. She didn't have to wait long. About three hours later, she received confirmation by phone from the ED physician that the source patient's test results had come back negative. It was apparent, however, that whatever information the ED physician provided, hadn't completely allayed her fears, as evidenced by her description of the conversation she had with her husband after coming home that evening from the ED:

[Told him] That I had had a pretty serious needle stick injury... that I was waiting to hear from the hospital whether I needed to take any AIDS drugs or not, the anti-retro viral, but I'm sure I didn't say anti-retro viral to him because he wouldn't have, not being a medical person, he wouldn't have known what that meant.

With the exception of being forwarded paperwork confirming the negative test results, Hillary had no further follow-up initiated by anyone from the occupational health department. When she returned to work the next day, she recalls being asked about her injury by a few concerned co-workers. But just as expressions of support from co-workers helped participants cope with the difficult nature of their PI experience, an absence of support or concern had the opposite effect. What Hillary remembered most vividly about the next day was a comment made to her by a second nursing supervisor and how it made her feel:

A different supervisor was on that day and her comment, I remember it really ticked me off, and it was: "I heard you had a little needle stick" and I thought it wasn't little and I said: "It was a sixteen gauge and it was hollow core and it went deep" and that was something else I remembered the doc telling me was that because of the size of the needle and because it was hollow core and because it bled immediately, that I was at a greater risk as opposed

to something that took a few seconds before blood showed from the injury. ...That ticked me off, because it didn't show any respect for what I had just been through....

Despite a positive outcome in relation to her testing, Hillary's overall experience left her angry and resentful, particularly with respect to the dehumanizing and disrespectful treatment she endured from her nurse supervisors. Even her subsequent attempts to positively advocate for changes she believed needed to occur to improve safety within the organization resulted in uncaring and unsupportive feedback. Hillary described the 'final blow' as the negative annual performance evaluation she recently received from her supervisor. In all her years as a nurse, she stated it was the first time she had received a negative evaluation, something she attributed to the fact that she had been vocal and persistent about the lack of policy and procedure for employees who sustained injuries away from the main campus. She shared several of the written comments from a copy of her most recent performance evaluation including: "Hillary needs to have better insight into the way she communicates issues to the supervisory staff and her coworkers. Hillary's behavior has led to trust issues and concerns about department image."

Vanessa's experience in Occupational Health sounded fairly straightforward based on her brief description:

[they discussed] What the pros and cons were if it was a high risk of starting, they call it the cocktail, starting treatment, the prophylactic treatment and if that was something I wanted or not and then they drew labs and I went back to work. ...Because it was such a low risk I deferred [PEP]. It wasn't a hollow needle. It wasn't a known contaminated... well, it was possibly contaminated, but it could have been into the skin [or] it could have been just into the next dressings. I don't know how deep that went. Usually they go into the skin, but I was bleeding, but I don't know whether there was blood on that because I

didn't see it and at the time we didn't know his status, but he was pretty low risk as far as not ever having, I guess not ever just having it.

Despite the reassurance she had been provided by occupational health staff that her risk was low, Vanessa described how difficult she found it to wait three days for her patient's HIV and hepatitis test results:

Yeah, because they didn't know his yet, I could only in my head assume the worst.

Then I was thinking of his, before we kind of, not necessarily joked about his bachelor lifestyle and his multiple partners and stuff, but we would say: Oh well, which girlfriend's coming in today? Somebody would come in and they'd say: Oh, I'm his girlfriend and we were like: Oh, yes, have you talked to the other girlfriend that just left?

Ultimately, for Vanessa and other participants, the information that provided the most reassurance and relief from anxiety were final test results – both the source patient's and their own. Temporality is central in this aspect of the PI aftermath. Throughout the PI aftermath, participants describe heightened stress and expenditure of much emotional energy waiting for serial and final test results. Fortunately for Vanessa, she was notified that same weekend that all test results had come back negative. No additional follow-up was initiated and it appeared that the care provided to her by occupational health staff met her needs.

Less responsive and an obvious source of upset was the disappointment Vanessa felt and shared concerning the apparent absence of support or concern from coworkers following her injury:

Maybe because of the way that one nurse treated it, it didn't seem to carry a big sign that this is something that happened. I don't even know if the charge nurse passed on a report to the next shift. Because I know like when I did break my finger at work that they told people

that happened and I felt this was as significant as a broken finger. Yes, because I don't know if it is, but I feel like it should have been passed on. Especially where I work, there definitely would have been an: Oh, I heard. Like everybody hears. That if somebody, like for an example, when I came back with my broken finger, like I went back to work the next day and everybody was like: "Oh, how's your finger? I heard what happened." And nobody said: "Oh, how you doing? I heard what happened."

Regardless of the final outcome, Vanessa needed some indication that her co-workers recognized the difficult nature of the ordeal she had just been through. In the absence of any acknowledgment, she felt a void – like nothing had happened to her, or that others didn't care.

Sandy worked in a DOC facility without an occupational health department. Despite that fact, she recalled a very reassuring encounter after her injury with the covering physician who was a moonlighter:

I was sent down to the ICU department where the doctor was, the doctor on call. They were really good. The funny thing is, these doctors, they're all kids. They're all kids and yes, they were really good and the intern was there, too. ...I felt very comfortable with the whole process and I wasn't alarmed. I guess because they were comfortable. ...They took blood and instantly put me on medications because this patient is HIV positive and [has] hep C. Immediately I was given medication. Within two hours I was put on medication, given a prescription that I got filled the next day at the pharmacy.

A very different experience from Vanessa's, Sandy described initially not taking her exposure as seriously as other staff did and finding the support of coworkers and other nurses reassuring when the reality of her circumstances finally struck her:

They were very sympathetic and I was really surprised. I was like, why? And that it was

me not taking or seeing the seriousness of this. I see that I didn't take it as seriously as they all were, but really what I was most amazed at was the stories from the other nurses, you know. Yeah, that happened to me, yeah that happened to me. When I had gone down to ICU one of the nurses there told me, because she was watching everything, the ICU is very small there, she told it had happened to her, too and she said she was okay. She had to go on the medications and everything turned out okay, the nursing supervisor. And then I'm part of a fellowship with a bunch of nurses in it and I shared with them being on the medications, because I got, I kind of got very sick with it and they shared with me, you know, their experiences as well. So, yeah, I know someone that was on it twice. She had two finger sticks.

Not accustomed to being open with her own feelings, Sandy was amazed at the generosity and of nurse colleagues who were willing to share their personal stories and experiences with her. That sharing provided her comfort and reassurance throughout the time she struggled with anxieties concerning her own health outcomes following her exposure.

Sarah shared a different perspective when reflecting back on concern expressed by a relatively new nurse manager whom she didn't know very well and other nurses' sharing around their own needlesticks:

That [her injury] was around the time that we were having a change in nurse managers. So I think it was our new nurse manager who I didn't know very well and I mean in general working on the night shift, you really had very limited contact and so I think that she made sort of an official 'How are you doing?' and tried to do that a couple of times, but there wasn't, I think I pretty much said: "You know, I'm doing okay." ...How are you doing after the needle stick and how are you doing at work? Are you concerned about working in

general? And I pretty much brushed them off, I think. Personally, I didn't really feel that traumatized and I also didn't know her very well. It was interesting, among the nurses, it was really interesting, because after my needle stick several months later another friend of mine at work got a needle stick and the same thing happened, that all of the older nurses pull out all their stories as a way to relay 'Oh, you'll be fine, Oh, you'll be fine,' but also I think it's to re-experience their own as well as the time they were assaulted by a patient.

[It] Gives them a chance to talk. I think that their intent was to normalize your experience and to reassure, but obviously I think it's a double edged thing.

Cindy questioned the sincerity of concern expressed not only by her relatively new nurse manager following her injury, but also the motives of nurses who shared their own PI experiences. To her, it sometimes seemed more about the nurse than the person to whom the nurse was speaking. She believed a nurse's injury gave colleagues an opportunity to provide support, but that it also represented for them 'chance to talk' – not an unreasonable supposition, given the limited opportunities nurses have to talk about traumatic experiences in health care.

Maria sustained a low-risk exposure with her first PI and reported having had an initial experience with Occupational Health that was relatively positive:

No need for any meds or anything else. I went back and the doctor said that everything was cool. ...Ultimately, I felt like I was relieved, ready to go back to work. It was, I felt very safe about what had happened. I didn't really feel like I had done anything seriously wrong. I was grateful to know that the organization was willing to get me right down to the emergency room and so forth and so on. So, I just, I just felt a great sense of relief and went back to work, kind of like, Okay, I don't want to get in that kind of situation again and I did it again.

Maria makes a specific point as she reflected on that injury experience of referring to the support she received from her organization. Unfortunately, Maria's second experience was very different, beginning with a nursing supervisor who failed to understand the importance of being seen in a timely fashion after an injury, rather than waiting to the end of the shift as she encouraged her to do. Maria was evaluated at a nearby ED by a nurse practitioner, who assessed her exposure as low risk and argued against the need for PEP. Maria described her experience with the practitioner and her thinking behind opting to take PEP:

I was seen immediately and counseled and I really was extremely grateful to the nurse practitioner with whom I spoke. She was clearly very experienced and was very helpful, answered all my questions. She strongly recommended that I not take any kind of medication, but I said: "Well, before I decide that I would like to call my primary care provider and just discuss it with her" and I told my doctor and I had told the nurse practitioner: "I don't know what the test results might be from the person himself and I don't know if he's ready to talk with me about this situation," so my primary care provider said: "Go ahead and take whatever they want to give you and take all of it." So I got Kaletra and Combivir.

Maria's decision to take the PEP, supported by her primary physician, were strictly related to her lingering concerns about the source patient who had yet to agree to be tested. Maria took the prescribed meds for three days. They made her so ill that she had to leave work the next day after vomiting several times while caring for her patients. Test results from the source patient had still not been reported, so she did her best to continue taking the meds. Desperate, on the third day, and with no alternatives offered by occupational staff, she finally contacted her primary care physician to inform her of how ill she was, and she was instructed to stop the meds. Fortunately,

her clinic physician colleague was able to track down the source patient's negative test results later that afternoon. Six months later, her final serial test results completely eased her worries.

Maria spoke about the support she received from other colleagues as she went back for serial lab tests and, like other participants, encountered other employees eager to share their own injury experiences with her:

I would say to the person doing the blood work: "I had a needle stick and I'm here for follow up" and each time it was a different person and they would say: "Yes, I had a finger stick or I had a needle stick, too" and I feel like it was a really eye opening experience, and a learning experience to understand that other colleagues had been through....

Unlike Sarah, Maria internalized similar shared experiences as expressions of caring support and concern.

Cindy, the NP who cut herself with a scalpel while debriding a calloused foot ulcer in a diabetic patient with HCV, described her occupational health experience as very positive:

It was excellent. They were very supportive. They have a very good protocol for treating sharps injuries and exposures and they knew exactly what to do and everything they sent to me and they answered all my questions, gave me very good instructions and I always felt confident that they would help me through whatever was coming next. ...They did offer me prophylaxis for the HIV and I opted out of it, because I just had this feeling that I was going to be okay and I didn't know for certain his HIV status and that was available I believe 24 hours later and it was negative. They retested me. I'm not certain if they retested him. To clarify that, I'm thinking they did.

Cindy valued the efficient, competent, and knowledgeable care she received immediately after her injury. Within a short time, however, her experience was complicated by a severe hand

infection requiring weeks of intravenous Vancomycin. In the midst of that treatment, Cindy started feeling very ill and, aware that her liver function tests were elevated, became convinced she had been infected with hepatitis C. She spoke about and credits her extensive support system, including her husband, her physician, her friends and work colleagues, with getting her through a very difficult period of illness and anxiety:

I think that [support] made a huge difference because I didn't feel well during the treatment and it was great to have people that I could fall back on. I have friends that would cook dinner for me and my family and I had my husband taking care of the IV site. I had rides back and forth to the hospital to get my blood work if I didn't feel like driving. I had a great support system and this experience made me realize how important that is, especially as things come up and you need help coping in one way or another.

In Cindy's case, the help provided by friends and family was invaluable as she became physically incapacitated during treatment for her hand infection. As someone not accustomed to needing to ask for help, it also gave her a new appreciation for the importance of a good support network.

The emergency department staff provided care to Cookie that was attentive and compassionate. Her experience with the occupational health system was not as reassuring or responsive, particularly in the face of the severe symptoms she developed on PEP:

When I went upstairs [the next day to the OH clinic], I said: "I just ache all over. I feel terrible" and they just said: "Oh, uh uh" and they said: "Well, maybe it's the Kaletra" or something like that and I said: "I'm exhausted. I'm not sleeping at night." So he gave me a day off. ...I think I felt like a little betrayed by the Occupational Health nurses. I felt like instead of them trying to offer me or suggest that, you know, if you don't feel good stay

home, if you need to sleep through the day. I felt like I needed to sleep at any time I could because I was up most of the night and I switched my meds around and tried to take them at night, and umm, so I wouldn't feel as bad or try to sleep through those side effects and I would wake up and I'd feel like I was hit by a Mack truck and I didn't realize that this is what was normal for these meds. So to experience that and then finally someone came up and said to me: "I couldn't work taking this" and I said: "What'd you do about your time?" and he goes: "They paid me for it" and I went back up and I talked to someone else and I said: You know, I just felt like they [OH] didn't want to talk about it sometimes.

Cookie felt not only abandoned, but also betrayed by an occupational health staff who were dispassionate and ineffectual in their responses to her desperate pleas for help. Rather, her colleagues shared the information that finally made it possible for her to adapt to her difficult situation.

Cookie also spoke about how distressing the lack of collegial support was and how feeling so alone made her feel even worse throughout an already demanding experience:

It was the next day and I had to go to Occ Health. They [the OR] had to find time for me to go. So I tried to do it in between cases and I went up.... ...and no one [from the OR] said anything to me. Not one person. ...I kept thinking about why isn't anyone from the hospital calling me? Why aren't my friends calling me? Why aren't my peers calling me? Why isn't my head nurse calling me? I just couldn't believe it....

Cookie went as far as to consider writing to the hospital CEO about her experience:

I remember thinking I was going to write to the CEO of the hospital and tell him what it's like to walk through this process alone and how it's just looked at as part of our job and until you hit the emergency room where you see some people with some compassion. It

wasn't that my charge nurse didn't have compassion. She did, but you are working in an environment that's very stressful and there's not, you know, your staff is all busy. ...I feel like they don't want to think about it. I feel like they don't want to think about it as the severity and it's just an annoyance and it's another body down. I really feel like there's so much pressure to get things done, that there's a surgeon at the desk at all times trying to get their cases done that this emergency of a staff person just getting stuck is just irritating.

Cookie's hurt and loneliness are palpable as she realizes that her horrific injury was viewed by OR staff who were present as just an inconvenience, an annoyance, another body down. Even worse, actions by co-workers the next day compounded her injury and hurt. The abandonment she feels is almost too much for her to bear as she tries to excuse callous, dehumanizing, bullying behavior by attributing it to a busy, time-pressured OR environment.

Maggie's anxiety-provoking exposure became even more difficult for her when it became apparent that confusion existed among her providers about the correct protocol and how best to treat her injury. She recalled what happened as she listened to the conversation taking place outside of her room:

So they manage it, in my particular institution, on the non-acute side of the emergency department. I actually know the protocol because it's certainly something that we see there. It really stunk being on this side of the protocol, not the work-up piece of it and it was a little disturbing, because there was old paperwork, there was new paperwork and it's like no, I can hear them talking: "No, we don't do it that way anymore" and there was a lot of confusion and I kind of just took all that in thinking: Wow, this should not be confusing. This should be really straightforward and I was struggling because I'm like, Are they doing the right thing for me? Because clearly they've got different stuff here.

Maggie wants answers, not confusion and indecision from the physicians caring for her. The lack of an up-to-date protocol added to her own struggle to stay in control and undermined her ability to trust whatever information or treatment recommendations they made.

I just couldn't get enough information and you could have told me the same information, five different people, but somehow, I don't know; either it wasn't computing or I wanted a different answer. I could have heard it over and over again. I think I was still in the shock phase of I can't even believe I have to have this discussion with anybody.

At some level, Maggie is able to recognize that the intensity of being in shock made it almost impossible for her to take in the information being provided to her. She also admits she didn't like any of the answers she was getting.

After starting a two-drug PEP regimen, she followed-up in the Occupational Health Clinic three or four days later for baseline testing and to be seen for symptoms related to the PEP. Maggie described how different the reality of the side effects she experienced were from the information she had been given at the time they were prescribed:

Boy, nothing can prepare you. They write them out and they give you those prescriptions like they're nothing and I just remember thinking, whoa, it felt horrible. You know these can make you feel nauseous and you can have GI upset. I don't think anyone talked to me about the fatigue. No. And I wasn't sure when I felt that way if it was from the medicine or if it was because I was so emotionally distraught over being stuck and so it wasn't until I got to Occ Health, which I want to say was probably three or four days later, between the weekend being in there and me not feeling well and then one of our nurse practitioners that worked moonlighting in the ER was also an Occ Health and it's good that it was because she kind of pushed me to come in. I was just going to get grin and bear it and get through it

and take the meds, but it was like nothing I ever could have imagined.

Not unlike other participants who were prescribed PEP, Maggie was unprepared for the side effects she was experiencing. Unlike others, she had to be pushed to come in to be seen by a nurse colleague who worked in Occupational Health. She was going to ‘grin and bear it’ rather than asking for the help she needed.

Maggie struggled with side effects for the entire 28 days she took PEP, causing her to miss work for the entire period. She recalled how comforting and reassuring the support of colleagues was during that difficult period:

Everybody was so supportive and caring. I got lots of e-mails and phone calls. So people at work were fabulous, you know, and I think when I came back and when I wasn’t feeling good, people wanted me to leave. “Go home, you don’t feel good. Take care of yourself, you’ll get through this, it’s twenty-eight days” and when I came back after I finished all the medicine, just the warm welcome and everybody was [saying]: “So glad that’s over for you.”

The support Maggie received from colleagues allowed her to take care of herself without adding additional burdens to the stress she was already feeling. The experience of unconditional support from work colleagues, in particular, eliminated any worries she had related to being out of work.

Sarah, whose exposure involved an HIV and hepatitis C positive patient, was seen in the ED after her injury on the night shift. Despite being busy, she recalled her care was provided in an efficient and supportive manner:

I went down to the emergency room and I walked in and I said you know, “I’m coming from my floor, this is the deal” and they’re like: “Sit tight.” The emergency room there was always packed, always, always packed and they basically let me hang out in the

doctor bay of one of the sections of the emergency room while they went through a very quick history. I did a pregnancy test and then I was on Kaletra and Combivir within the hour and everyone was sort of like: “Are you freaked out? Are you freaked out?” I said: “I think I’m okay, I think I’m okay.” So I was down there for maybe two hours. ...I felt like they did everything right.

Sarah was relieved to receive care in a packed ED that was efficient and supportive. Her dubious response to colleagues who inquired as to whether she was freaked out indicated that she, like other participants, needed time to feel reassured and less ‘freaked out.’ After being seen in the ED, Sarah returned to work to finish her shift. She spoke about the reassuring reception she received from co-workers:

I went back to the floor and everyone said: “Oh you know, this has happened to me.” I think almost every nurse I was with had a needle stick at some point in their career and a lot of them had had them before we had exposure prophylaxis. So that was reassuring and then I think I went and looked up again what the real risk was and it’s .3 percent or .2 percent and so, what does that mean? And reassuring myself that it was really low risk, I wasn’t drawing blood from a large needle. [laughter] Very intellectual I think.

Like other participants, Sarah felt reassured by work colleagues who shared their own PI experiences. Once back on her floor, she also sought reassurance from additional information related to ‘real risk,’ and recognized she was coping by intellectualizing a very scary experience.

Feeling somewhat reassured by recent HIV viral load testing on the patient, Sarah followed up with occupational health the next week and throughout the next six months for serial testing. She described feeling less reassured with the care she received in that setting:

My [OH] contact was a male nurse practitioner who was very, he’s European and he was

quite standoffish and I didn't love him and I didn't feel like he really knew what he was talking about. He couldn't really remember the right... this is when we check the viral load, this is when we check the antibody type of stuff and I just didn't really feel like he was that organized or cared that much and I sort of felt shuffled between him. I kept going back and forth between him and the nurse, you know. I think it was just the nature of the practice....

The male NP and staff in the Occupational Health clinic did little to instill Sarah with confidence during her follow-up visits. She lightly dismissed the feeling of being shuttled back and forth between him and the nurse as the nature of the practice. Whether follow-up testing was done correctly, however, was of serious concern to her.

Serial testing conducted four times in the Occupational Health Clinic over the course of the next six weeks was described by Sarah as a particular source of anxiety:

Every time I would get my blood drawn and I think that's the same with anytime you take an HIV test. Umm, but no matter, I think it was worse in the beginning, but at six months, I was like, it's not going to be positive. I really felt very confident it's not going to be positive, but when they drew it, I was still nervous.

All participants described between labs being drawn and results being reported as a particularly anxious time. Sarah's final test at six-months proved especially anxiety-provoking and was compounded by the fact that the NP was unavailable to give her the results within the typical time frame:

I think it [her anxiety] was sort in the moment when I was getting it drawn and then I would be really okay and then I think at the six month draw I realized that they hadn't called me with the results and I called and it turned out that the NP was on vacation that

week or something, but I definitely wrestled with the ‘I know it’s not going to be positive versus they haven’t called me, I wonder why they haven’t called me. Maybe there’s something wrong’ and then it was the one time I kind of got [sic] attitudey with the staff. It had been maybe four or five days or something like that and I just called and I said: “I don’t care if he’s on vacation. I want the results now” and they were negative, of course, but the time when it was drawn and then the time when you would receive the results always just kicked up anxiety.

Sarah speaks about ‘wrestling’ with knowing her results wouldn’t be positive and the anxiety that waiting for results provoked. This struggle she described was common to all participants with follow-up testing after PI.

Like the others who took PEP, Sarah also spoke about her difficulty with side effects, particularly in the early weeks of treatment:

I went home and I slept and started taking the meds as I was supposed to. Had a lot of malaise, had a lot of diarrhea and the malaise really pissed me off. It was really frustrating. I felt like crap. ...I’m somebody who usually doesn’t get side effects. I’ve had other friends who have had to take these meds and have flat out refused to because it made them so miserable and I did. ...I just felt wiped out, dizzy, headache, blah, total blah.

As an NP who cared for HIV-infected populations, Sarah was very familiar with the drugs she had been prescribed as PEP and their side effects. Regardless, Sarah still felt unprepared for the extent of illness and symptoms she felt during her month-long course.

Sarah described how fortunate she felt to have friends and colleagues who supported her during her treatment and follow-up period:

I really do think I was lucky in this situation because a lot of the people I was working with

and went to school were very oriented around HIV care anyway and also we're very open, joking, pretty casual folks in general. There's not a lot of taboos among my friends. I don't think there are really any. [laughter] So that was lucky I think, but I do think that just the idea that, yeah, that what it was, it was having to take, you're taking HIV medicines.

Sarah spoke on several occasions, including this one, about how uncomfortable she was acknowledging the stigma she felt while taking HIV drugs - particularly as a practitioner who worked to normalize the experience for her patients. Her friends provided a safe, non-judgmental place for her to talk about it. A discussion of the secondary meaning of PI and its aftermath follows.

Secondary meaning of PI and its aftermath – Sensing vulnerability. As the other essential structure that captures the meaning of the experience, *sensing vulnerability* represents a secondary mode of living in the aftermath of PI. Vulnerability implies susceptibility, not only in relation to the forces and influences in the present of a person's daily life, but also into the future. When afforded the opportunity to reflect on the meaning of their PI experience, the concept of *sensing vulnerability* was brought to the forefront by all nurses in this study. The initial meaning of PI and its aftermath, *needing to know it's going to be okay*, involved a time-limited period for participants that extended from injury to completion of testing. *Sensing vulnerability* involves meaning of PIs and its aftermath into the future. Projecting from past to future, temporality joins embodiment and relationality as central to the essential theme *sensing vulnerability*. In reflecting on their PI, participants look forward from their past and present. Reflection shifts from the PI as a past occurrence, to its influence in participants' future temporal landscape. Existence and being are no longer what they were before the injury, as new learning and awareness are revealed by the PI experience. Reflections on the PI experience included thoughts and symptoms related

to health vulnerability that emerged in the past and present as a direct result of their PI or its treatment, as well as thoughts concerning the vulnerability they perceive following their injury relative to their future life, and the lives of those around them.

As a result of their PI experience, participants reflect on vulnerabilities relative to future health as well as the impact of supportive and non-supportive relationships. The necessity of being vigilant is also identified by participants as an important means for reducing future health vulnerabilities.

Facing the fragility of health. A new appreciation for the fragile nature of health was communicated as a dimension of *sensing vulnerability*. Among the eight nurses in this study living in the aftermath of a PI, five nurses experienced a sudden disruption of previously healthy states while taking PEP. All participants focused on the potential that had existed for future health to deteriorate as a result of their injury. Other reflections relate to consideration of the health risks posed by the work of nursing, and the potential impact on themselves and others in their lives in the event their future health was negatively affected by illness or disease.

Hillary spoke about the vulnerability she felt to having a negative health outcome after her injury, even in the face of already having a terminal illness:

I think that's what bothers me probably the most, other than the fact that: Oh my God, what could I have gotten? And I wonder too, because I've already got a terminal illness that I don't often focus on what could be. That's almost like, it's one of those things that you kind of put aside once you've been given a serious diagnosis.

Hillary articulated a disconnect from her reality here – first relative to fears she admitted to experiencing after her PI, and then arguing that having a terminal illness keeps her from focusing on other future health concerns. While she may be in denial about future health concerns,

uncontrollable physical symptoms she acknowledged relative to an aversion to IV needles she developed after her PI indicate otherwise:

I'm experiencing some type of an aversion to IV's now and it's almost like a dread and it's something I have to face every day that I'm working in the infusion room, because you have to start an IV and I don't have the aversion when I'm accessing a port-a-cath because even though I'm going in through the skin, I'm going into a device and I don't have it with the PIC line, it's the peripheral lines that when I sit down on that little stool and I gather all my equipment and I put that tourniquet on, every time my stomach does a little flip flop. ...I can't say that I'm thinking of the injury, but what I can say is that this aversion didn't come until after. So there has to be a connection and it has to have at this point become more subconscious rather than conscious, because I'm not thinking of the injury. I'm thinking of this venipuncture and I'm thinking ew, ew, ew. I can feel almost like my bowels tighten up. I can feel my stomach do a little queasiness and it only lasts for a couple of seconds and I must be suppressing it in order to continue.

Vanessa spoke about the fact that her injury represented, in her mind, some sort of career milestone or first. It also brought to light her new awareness concerning the reality of health threats associated with nursing:

I think because I knew it was such a low risk that it was a relief. It had been on my mind, but it was, I guess, confirmation of what I suspected, that it would be negative. Kind of like the pregnancy test came back negative, but I think, I felt it was kind of a milestone or something in my nursing career and that was my first. I've already had my first med error, I've already had my first person I've done CPR on, so now if I had another one it's not the first one and I would know what to expect. I would say, though, that going through this,

including waiting for test results, made me think about the fact that things can happen in nursing, even though you do everything you're supposed to. Can't say I've thought about that much before this happened to me. Maybe a little bit when I had MRSA. That was job-related, too. But I'm young and maybe I didn't feel that those risks were real before. That my health could really be affected. This episode made me think about that more and reminded me I need to keep doing everything possible to stay safe on this job, even though I know things still might happen.

Vanessa's new level of awareness concerning on-the-job vulnerabilities to injury and illness serve as a useful lesson for her that not everything is within her control, especially in a profession as risk-laden as nursing. Her experience also re-commits her to vigilance in relation to observing on-the-job health and safety practices.

As one of the five nurse participants who took PEP after their injury, Sandy described its immediate and debilitating impact on her physical health:

I was told to take that for one month and after one week on it, I actually ended up having to call another physician and I was crying to him, I was so sick and all I kept saying is: "This is way too much medication. I'm only 130 lbs and I should not be feeling." Because I was sick, sick, sick and yes, they had overmedicated me. Yes, they had overmedicated me and then another infectious disease doctor called me back immediately, they were very good... called me back immediately.

Once her dosage was corrected, Sandy was able to reasonably manage side effects from the PEP, including the constant nausea that she experienced in the weeks that followed. At the same time, the experience left her feeling vulnerable in relation to her future health. She sounded a bit fatalistic as she spoke about the lessons she learned from her experience:

I don't want to say, it shouldn't be expected. It shouldn't be expected, but I believe that had to happen to me to really show me that nursing does have risks and that I need to be alert to them all and I should never take anything for granted. It's also made me appreciate that those risks can put my health at risk. I know nurses that are disabled with back injuries. I know one that developed TB because of working with patients. I was lucky this time and feel so relieved that I'm okay so far. I know this could have turned out much differently for me. I think about how important my health is and how quickly things can change. That's how I've walked away from this experience.

Like Vanessa, Sandy internalized the experience as a life and professional lesson – that nursing can and does pose very real risks to health and that she shouldn't take her health for granted or knowingly do things to put it at risk.

Within a relatively short time, Maria had two very different PI experiences. The anxiety she felt and displayed following her first exposure, and which led her to insist that source patient testing be conducted, was quickly resolved when the source patient test results came back negative within a matter of hours. She reported feeling 'a great sense of relief.' Maria's second exposure was not sorted out in such a quick or straightforward manner. The source patient's work history heightened her concerns and his lack of insurance delayed his testing. She made the decision, after speaking with her primary care physician, to take a multi-drug regimen of PEP that caused her to become very sick. She described what it was like for her when she went back to work the next day:

I tried taking that medication on Thursday, two and a half days afterwards and I came on with this sudden nausea and vomiting. The same doctor was working, there was nobody else in the clinic but myself. I was with a different patient and I said: "Excuse me" and I

went and vomited and came back and I said: “I’m sorry, I’m not feeling well. I’ll try and do what I can for you, but we’ll just sort of take it as it comes” and I had to actually excuse myself literally three times during that brief interview with that other patient. I think in fact I was doing a health clearance or something like that which usually takes about 20 minutes and I said to the doctor: “As soon as the other nurse comes in I have to leave. I’m really not feeling well” and he said: “That’s fine” and I talked with him about whether or not I should continue the medication. He was very helpful, he’s a good friend.

Maria’s side effects from taking PEP made working difficult, if not impossible. Yet, because she was the only nurse in the clinic, Maria felt obligated to continue working until her symptoms became intolerable. In the absence of complete results on the source patient, Maria described continuing the PEP, despite how deathly ill it made her:

He [clinic MD] was great and he spoke with the patient. The patient had gotten some testing. He’d gotten me some results, but at that point I was not yet sure that he [the source patient] was completely clear and it just gave me a tremendous amount of respect for people that do have to take that medication and don’t have the option of saying: “Well, okay, I can’t tolerate this.” But I thought to myself, I went home, I was due for another dose of the medication that evening and I was having the dry heaves, I was laying on the floor in the bathroom. I was not able to, I don’t think I would have been able to take even water to take the medication. So it was not really an option. So I called my primary care provider and told her what was going on and she said: “Well, you did what you could, let’s wait for the test results,” but it was a very strong experience to feel that sick. I called in sick the next day as well and so it was one hell of an experience.

Like other participants, Maria had never before experienced such a disruption in her health. Her illness on the PEP made her think long and hard about the fragility of health and her part in safeguarding her health into the future. She spoke about those reflections:

I think two things stand out for me. First, it made me aware of how fragile health can be and how quickly things can change. I feel so fortunate. This could have turned out differently for me. I often thought about how my life and health could have been impacted by this. I haven't had any major health issues up to this point in my life and I know I have a part in staying healthy.

Cindy's exposure to a patient with hepatitis C left her seriously worried about the potential for becoming infected and thoughts about her health and her family into the future. She recalled leaving work and looking for more information to lessen her anxieties:

I was very concerned and I remember going home and going on the computer and looking up all kinds of information on hep C and that actually freaked me out more than the original sharps injury... just thinking about the implications that that would have, not only for myself and my health, but for my family and what that would mean for my children if I were to get sick and have a chronic illness like that.

Cindy's focus shifted from the present to her future health should she become infected with hepatitis C as a result of her injury. Even more devastating for her was thinking about how such a serious illness could impact her family, particularly her children.

In the weeks that followed, she became more ill and was convinced that her health had not been spared. She shared her reflections during and about that difficult period:

It was very nerve wracking and I think again I'm not an alarmist, but when I have time to sit and process things, at some point I think I had convinced myself that I had hepatitis C just

because I felt so lousy, my liver enzymes were off and I was preparing for that by doing the research and figuring out what was I going to need to do take care of that and I know that's something that once you have it, you have it and I have a friend that has liver disease and she's able to make herself feel better through changes in her diet and stuff so I was already preparing to go down that road and thankfully we didn't get there. ...If I had ended up contracting HIV or hepatitis C, that would certainly have been a life-altering event. The sharps injury itself certainly made me more aware of the fact that I'm not invincible and that things can happen. I know I went through that as a teenager into adulthood like you realize you're not invincible.

Cindy was already projecting herself into a future where hepatitis C or HIV dominated her life and health. Beyond illness, the possibility of non-being became a very real threat in her mind. Fortunately for her, it was the Vancomycin, not hepatitis C that was making her so ill. Regardless, she carried her new awareness of the possibility of non-being with her into the future.

Post-exposure prophylaxis wreaked havoc on the health of every nurse to whom it was administered, including Cookie. She described how unprepared she was for the illness she experienced or knowing how to deal with it:

I worked the first week, a couple of days after I got stuck, because I didn't know any better and I was sick and I didn't realize the medicine was causing me to feel awful and I didn't want to take sick time so I'm just struggling through it and then they put me on a second drug Kaletra and that's what really caused me to get really sick and I didn't know it would cause such like joint pain and nausea and vomiting and diarrhea until the nighttime. ...I didn't quite understand that, you know, how I would feel and then finally one of the

nurse practitioners said to me: “Well, you’re giving a healthy body chemotherapy. You’re giving a healthy body medicine to take of someone that isn’t full blown AIDS....”

Not unlike other participants such as Maggie and Sarah, Cookie was experiencing an extreme level of illness and disruption of health as a result of the drugs she had been prescribed. To make things worse, a severe response to the stress she was feeling following her injury caused Cookie’s TMJ to flare. She talked about her subsequent visit to the dentist:

My TMJ flared up really, really, really bad and I thought I had a real bad, severe dental problem. I went down to the dentist and once he got me into the office and we were talking because I was having bridgework made, he said: “What’s really going on?” and I brought down my mouth guard. He told me to bring it down and he said: “I’ve never seen something so gouged in my life” and that’s when he said: “This isn’t normal.” I have such a high tolerance for pain normally that I would never even have called him [dentist] and I called and asked would he see me right away. I said: “I can’t stand it anymore” and then after I told him, he was really good. He said, cause when he went to look in my mouth, I said: “Please put on gloves” and “Don’t touch my mouth guard without gloves” and I had to tell him and I was ashamed of it [crying]. It was my fault and it was dirty and he totally understood and he took my mouth guard and he just checked it and he checked everything and he said: “You have gouges in your mouth guard.” He said: “I’ve never seen anyone do this before.” He said: “You’re under a lot of stress and I know you’re going to be okay.” He said: “Just keep this in your mouth all day long if you have to” and then he said: “Put a lot of warm compresses on it....”

Cookie’s health had been impacted on many levels. Her shame and high tolerance for pain delayed her visit to the dentist until she had no choice but to act. In the end, her visit to her

dentist would not only relieve her immediate suffering, but meet two other essential needs – to validate the tremendous stress she was under from the health threat associated with her injury, and to quench her desperate desire for human kindness and reassurance.

Maggie spoke about the stressful impact of the injury and PEP on her physical stamina and ability to function in her daily life:

I was enmeshed in school at the time. I had deadlines. I couldn't even work on my paper. I was so fatigued. And then I think I finally at some point, the first week, maybe second week, just realized I could not go to work for twelve hours, not because I didn't want to, it just... I was, I can't believe just, I felt like the life was taken out of me and people said that was from the meds.

Not known as someone who slowed down, Maggie's life energy was being sapped by the PEP. She had no frame of reference in her life for feeling so ill or fatigued and at the time did not understand what was happening to her. Maggie also spoke about gaining a new perspective on the uncertainty of health and the possible impact that acquiring an infection or serious illness could have had on her life:

When you get sick with things, I get the flu or I got a strep throat or I've got a GI thing, you kind of know what it is, you know, the time limitation. With this here, it was all so ambiguous, because there were questions I didn't have the answers to. So it was a whole different thing. It wasn't comparable to anything else. Yeah, it just wasn't comparable and then there were parts of me that would say: Okay, so what if it is? So what if you did get infected? Nowadays it's, you can have diabetes, you can asthma, it's a chronic illness you're going to have to live with. So I would talk myself into saying: Well, by all means today it really is. I'm going to have a lot of doctor appointments and I remember thinking

about that going, I hate going to the doctor. I make my appointment and then for a year and a half I keep rescheduling it until I'm too embarrassed to reschedule it another time and I'm thinking about that going, and you know, I did a lot of doctor stuff with my father and I just remember going: Ah, it's like hurry up and wait. Got to go to the doctor, I'm going to wait, how am I going to work? Yeah, it was thinking about all that which you don't think about when you have sort of the common illnesses that people get. You just know it's time limited, it's going to go away and ya da, ya da and this here was just all the gray zone, things you didn't know. It definitely makes you, it takes it to a different level that's not comparable to anything else.

Maggie had convinced herself in her illness that her worst fear was coming to fruition. At the same time she acknowledged it would be unlike anything she had previously experienced in her life, she told herself she would learn to live with HIV as a chronic illness. Even those thoughts led her to a whole new list of concerns into the future. Maggie also spoke about thoughts she had concerning her children and the fear they experienced related to her PEP-related illness, as well as worries for the future of her children in the event she became infected:

I was just thinking about my kids. It's like, Oh my gosh, I would never want my kids to see me sick and they did. They saw me during that period of time and they were old enough to know mommy's sick and I remember one of them had a parent-teachers' conference or something and when I went into the school, the teacher had said: "I heard you've been sick." I said: "How'd you...?" "Your sons told me that you haven't been feeling well for a while" and so just seeing the impact that had on my family and thinking about am I going to be sick like the rest of my life and what's that impact going to have on my kids, that was overwhelming when I think about that.

As a nurse specializing in the care of HIV patients, Sarah spoke about how she struggled with the dichotomy of what she knew and what she was feeling after her injury occurred:

I went back to work and I just kind of kept intermittently thinking about it. I'd forget about it and then I would remember it and I would just be like, oh, that sucks. I really hated that that happened and I had a big conflict with myself, because I felt as though, and I still feel, if I tried to normalize the experience to my patients, then I need to be okay with them myself and then I would be like, but this shouldn't happen and I wanted to freak out, but in the same way that I spent all this time learning about it, chronic now, not a death sentence. You know, it was hard to sort of intellectually rationalize and then also freak out at the same time. I mean I was scared. The big thing I was scared about was telling my parents and yeah, I definitely was afraid that it wasn't going to just be something that would go away and I wouldn't have to worry about it anymore and I wasn't quite ready to think about what that meant, but I could rationalize what that meant. I'd be okay, I'd figure it out, but yeah, I think in the moment and that night, it was interesting.

For participants like Sarah, Maggie, and Cookie, a protracted period of uncertainty surrounding the fate of their health outcomes led them to project themselves more deeply into a future where health was fragile and their very existence was in question.

Distinguishing supportive vs. non-supportive relationships. Within the context of life experiences, individuals draw strength and support from those around them in the surrounding world. Accordingly, in the context of the PI experience, nurse participants sought and drew support from those around them, including colleagues and others to whom they felt a connection in their world. Social support was identified as an important mitigating factor that helped nurses cope with the vulnerability and distress associated with their PI experience. For some who

sought or desired support, it was readily available from colleagues, friends, and/or family. For others, social support was less easily accessed from those around them. For all, the vulnerability nurses experienced following a PI helped them distinguish between supportive and non-supportive relationships within their communities and respective worlds.

Hillary spoke about drawing her support from her husband and the disappointment she felt in nurse colleagues after her injury. For her, it was a sobering and maddening realization that those she had viewed as a caring professional community were not there for her when she needed their support. Overall, she described the experience as leaving her feeling bitter and abandoned:

I definitely feel like I have not received respect or compassion from my coworkers as a result of this incident. I can't say not all of the coworkers. As I say, some have been condescending and others have been caring.

Vanessa also expressed disappointment and frustration at the lack of support and failure by peers and colleagues to even acknowledge what had happened to her:

It felt like staff didn't care. I don't think anyone took it seriously and I don't know if that was the same as the other girl's response that. "Oh, are you going to get checked out for that. That's stupid, that's such a low..." You know what I mean, like it was a finger prick or whatever. Made me feel like I was dealing with this more on my own. And I know there were some staff, like the charge nurse, who were supportive, but I was disappointed that more of the staff I considered friends didn't say anything. They weren't just colleagues to me. I thought we were friends. It could have turned out differently for me and that's changed how I feel about some of my relationships at work.

Vanessa felt disillusioned and hurt to know that so few of her nurse colleagues – some of whom she considered friends – were unable or unwilling to be supportive at a time when she both

desired and needed their support. In some cases, that realization had a lasting effect on her relationships. Vanessa also spoke about the apprehension and reassurance she felt as she informed someone she had been dating that she might have been exposed to HIV:

It was the first time I had ever been HIV tested and being 29, you'd think I would have done that at least once by now, but I don't know why I never had. All of a sudden I'm thinking, you know I went to see the guy I was dating and I had told him that I had gotten stuck and we always used protection anyway, but it was in my mind a different way even for a 24, 48 hours that was... just because I had never been tested, like when you're waiting for that pregnancy test to come. Well, what would I do? What if...? How would this affect me and it didn't seem to. I guess the fact that he didn't get upset or freaked out either that, you know, because I said the way that it happened and what the risks were.

In some respects, Vanessa seemed to be testing her partner with her disclosure, particularly since she would know her patient's test results within a matter of days. She needed to know 'what if?' and to feel reassured that it wouldn't affect his relationship with her. Fortunately, he passed the test.

Sandy described how this experience made her realize the appreciation she felt for all the support she received from colleagues and how necessary support is, especially for anyone working in health care. In particular, she focused on the value she attached to the support of the fellowship she belongs to:

I also think, after seeing all the support I received and what a difference it made for me, that now I realize how important it is that we care about one another. Especially because health care can be so chaotic. ...I'm part of a fellowship with a bunch of nurses in it and I shared with them being on the medications, because I got, I kind of got very sick with it and they

shared with me, you know, their experiences as well. So, yeah, I know someone that was on it twice. She had two finger sticks. I realized as I went through this, that there weren't any concerns or fears I couldn't share there. I know the fellowship is a place where I'll always receive genuine caring and support and that's comforting to me.

While she made a point of bringing it up during her interview, Sandy seemed emotionally detached from any feelings she might have had concerning the lack of any mention about her injury by her nurse supervisor:

The funny thing, what I'm more surprised about, is that my, who runs the floor?

What's that nurse position called? The nursing supervisor for my floor, for the three shifts, he never knew about it. I was really surprised. He never mentioned anything to me. I would have thought, you know, that he would have got report of it, but he never mentioned it. I was surprised that he wasn't aware what was happening on his floor? That's what I was surprised at.

Even when asked if she was looking for him to acknowledge what had happened to her, she was reticent: "Well, I wanted, it was like, don't you know what's going on your floor? Because I guess for me, I'd want to know everything. What's happening to who, where and what. That's all. I was just surprised. Yeah." Like other participants, Sandy looked to her nurse supervisor for some type of validation or acknowledgement of what she'd been through because of her injury. Unlike others like Vanessa or Hillary, however, she was unable to admit that his silence disturbed or upset her in any way.

Maria expressed spoke openly about the importance she attached to support from colleagues:

It's that kind of support from another colleague that is a really important piece to me. It is a team effort like I said before. I don't expect every member of the team to be supportive, but

as long as there's some supportive colleagues...."

Like Vanessa and Hillary, Maria described feeling abandoned and disturbed by the lack of support or concern from anyone in an administrative or supervisory role after her second exposure:

I think it was because I didn't currently at that point have an official supervisor delegated as a go to person and I think the woman who was the administrator who was sort of taking over that role was just overstretched. I don't think that she really did a very good job helping me with that. We didn't get a supervisor for a very long time, but when I did go for follow ups, I always informed her, I told her what the results were, I faxed stuff to the Human Resources all the way through. I tried to keep them informed and I just, I felt that time around that they really didn't care ultimately.

From the very beginning, Cookie experienced a deep sense of isolation in her suffering. She described the ride home from the ED:

I think it was really lonely, really lonely. ...I had all these thoughts coming through my mind of people that I was going to write to and talk to and I pictured myself not being able to work and converting and that it really wasn't going to matter to anyone.

Cookie fantasized on this and numerous other occasions about speaking up for herself, but in the midst of her extreme grief and sadness, she wasn't able to take further action. Her isolation persisted until she finally stopped looking for support from people who were incapable of providing it in this situation. She shared the life-changing nature of her injury and the subsequent decision she made to be honest with herself and do whatever was necessary to take care of herself:

I finally let myself just sleep, get up, eat or drink whatever I could that would make me feel

alright and then I started going to support group meetings and saw good friends of mine and I shared it with them and they were incredible. They just were great to me and I finally felt okay. ...I mean it [the injury] changed my life in a heartbeat. I mean [before] I did all sorts of overtime. I was always there. I was worried about my house, I had just bought a house, but you know, it was a bittersweet five weeks. I was honest. I talked about my feelings and I had a lot of loving support from people and as sad as I was and when I started to get upset that I wasn't hearing from anyone at the hospital, I could say to myself: Are you being taken care of? And I felt like, yes I was. I felt like I was and I was in good hands with the friends that I had. I felt like I got what I needed from the right people. ...Some people got it, some people didn't. The people that went into denial about what was going on and didn't ask me how I was doing, I could tell they just couldn't handle it. Because I kept thinking about why isn't anyone from the hospital calling me. ...I just couldn't believe it and then when I was able to reach out and get the support I needed, I was okay.

When she finally realized that she needed to ask for help, Cookie found a support network that responded. Soon she was able to reframe her situation and let go of people she grew to understand were incapable of being supportive under these circumstances.

For Maggie, realizations regarding supportive relationships in her life had a profound and lasting impact. She spoke candidly about how painful it was to realize her spouse could not be there for her during an incredibly difficult time:

I think it [her injury] had some great impacts in my personal life. I mentioned earlier that my partner wasn't all that supportive and I remember that when I think, you know, I'm not in that relationship any longer, when I think back, some of the key things along the way that were instrumental in me ending a really long marriage. That is one of them, the lack of

support, because I remember I just wanted to collapse and sob my brains out, but I wanted somebody to tell me it was going to be okay and the person that I spent over, you know, at that point, fifteen years with couldn't do that. So it did change my life that I had to reach out to friends and other family members and my partner wasn't able to do that and it gave me a great appreciation for colleagues and how they can either positively or negatively impact you and, in my case, I think it was very positive. I felt that they really cared about me. I didn't have one moment of guilt about not being able to make it through my shift or show up at work because of how bad I felt and you don't get that at work all the time. And I felt that and I felt it was genuine and it makes me value collegial relationships.

For Maggie, the profound nature of her PI experience was the final straw that ended her marriage. Her experience was life changing in other ways that brought a positive awareness of the many caring, supportive people in her life.

Sarah spoke about how fortunate she felt to be surrounded by so many supportive colleagues and other nurse friends who understood what she was going through and needed. She also indicated that she was selective in disclosing information about what she was going through, and that she only did it with people who were close to her.

Being vigilant as necessity. Experiences leave an inevitable imprint on a person's being. There is a temporal nature to experience. It is not grasped as it occurs, but rather through reflection on the past. There is no question that the nurses in this study are different than they were prior to their PI experience. All participants are moving into the future changed because of their lived experience of PI. For some, that change involved a heightened awareness of vulnerability based on their injury and led to reflections about future injury prevention and the need for vigilance when working with sharps. Others shared a more existential perspective in

relation to the connection they made between their injury, and their future life and health vulnerabilities.

For nurses like Hillary, vigilance related to future injury prevention became paramount and was reflected in heightened awareness around sharps and advocacy efforts to safeguard her own safety and those of colleagues. She spoke about one particular aspect of the change that occurred as a direct result of her injury:

It turns out that the policy and procedures were for the main campus. They weren't quite relative to a free standing facility and that it was the first time that they had been made aware that the policy needed to be addressed and that they were going to work on that.

...Now there's a folder in and of itself, a little notebook that says policy and procedure for needle sticks. It's up at the nurses' station and we now have little posters explaining what to do and the posters were all laminated and hung up in the various parts of the department and then there are hand written bubbles in between because they're laminated posters are made for the main campus not for the outlined facilities. So the bubble that's added tells us too that in the event to draw labs on the other person and get consent.

Within her practice setting, Hillary became a strong and persistent advocate for providing access to safer devices. After being made aware the day after her injury that sharps equipment being used in their facility was outdated, Hillary communicated with other staff to let them know newer equipment would be brought in. She recalled what happened:

When I came into work that day, the next morning, the supervisor that had filled out the paperwork for me, said: "You'll never guess what I found out after your injury. I called over to the blood bank at the mother site and it seems that the equipment we're using is outdated. We've got new equipment now that has safety devices on them" and I thought...

Oh, fancy that, and I said: “When are we getting them?” “Well, they’ll come for in-service either next week or the week after” and I asked, “Well, what about in the meantime?” And there was not an answer to that. ...So when I communicated to the rest of my staff that this woman was showing up at our facility in two days with this new equipment and gave the date and time, the second supervisor approached me and she said: “What are you doing?” and I said: “I’m working on this to prevent any further injuries” and she said: “Who told you blah, blah, blah?” So I used the name of the person that was on the needle stick that was covering the needle stick committee who was covering occ[upational] health for that particular type of injury and she said: “That’s not her title.”

Hillary’s nursing supervisors made it clear they didn’t share an appreciation of her advocacy efforts or direct communications to other staff to keep them informed of changes she believed were necessary for safe practice. While waiting for the new equipment to arrive, Hillary spoke about steps she took to advocate for her own health and safety and the ultimate price she paid for being so vocal about the need for change in her facility:

When we did not have the replacement equipment. I refused to do any phlebotomies until we had the replacement, the new equipment that had that safety guard on it. Whether I would have had to continue to refuse to put myself in that position, I don’t know how long that would have happened if I hadn’t been pushing as strongly as I did, but I felt like if I hadn’t pushed the issue, or pushed the envelope. I’m sure I got supervisors pissed off at me, but I finally got the equipment. So I don’t know how to weight those two because now I don’t have the trust from my supervisors, because they’re going to think that I’m a pain in the butt and that I go over their heads and that I pushed their buttons.

Hillary paid a price for her visible and vocal advocacy efforts, but took pride in the fact that because of her efforts, staff now had access to safer devices.

Vanessa spoke about having a heightened awareness of sharps and a renewed commitment to protecting herself and encouraging others to do the same as a result of her injury:

I think I was pretty standard about my protection beforehand. I do think this was something that definitely increased my awareness and care around sharps, even though I think I was pretty aware beforehand and pretty standard in my personal protection equipment. I also think I am more inclined to encourage peers to take care of themselves and report incidents that might have put them at risk.

Despite her longstanding observance of well-established health and safety standards, Vanessa realized that her injury further heightened her awareness around sharps and that she was now more likely to encourage colleagues to observe safety standards. She also discussed more specifics in relation to the cause of her own injury and consideration in relation to future injury prevention:

I think that like when we change beds now, I will put on the sterile gloves more than before, they're thicker, and because we do a lot of pulling and everything with the patients and I know that there are staples in there too. That had never really crossed my mind before that the staples as part of my enemy, but yeah, I feel like even though they're the ones that didn't hold up that I don't think there's anything better than that and it's a difficult environment with the first set of gloves, the plastic under there and then sometimes if our gloves get dirty inside, we can take off the gloves and we'll have new gloves in there if your size is in there or if you take your hand out and you take off that glove, technically now this one's clean so you could pull a new one out of the box and put that one on that hand. I've

never actually put on two pairs of gloves, but I've always, but we use sterile gloves for our dressings which are thicker.

Like Vanessa, Sandy reflected on her PI as one of those first-time experiences in a relatively new career and how it impacted her practice moving forward:

This is real life and I am constantly getting those first time experiences and I remember when it first started happening, I'd be running out to the charge nurse and then blah, blah, blah, "Come here, I need some help" and she yells: "Put oxygen on them" and just all these things and I'd be like "ah" and you know so I have all of those and it's still constantly happening and I walk out of there at the end of the day like, wow, this is what I got to see. Like last week I had my first seizure happen right in front of my face. I was scared to death and I'm like, what do you do? Because you forget everything for that quick moment and you get through it and you chalk one more thing up that you know now what's going to happen, but the needle stick, same thing. Now I know. Now I know how to make sure I cap everything. Now I know how to just be focusing, keep the needles here, put it in the sharps container immediately.

In Sandy's mind, her injury was a stark reminder and lesson about staying focused and doing what was necessary to keep herself safe, particularly around needles. Sandy went on to speak of the need for vigilance, not only as it influenced how she worked with needles in the future, but also as it related to all aspects of her practice:

I'm very conscientious with anything to do with needles, very, very conscientious. As soon as I give any sort of injection, I walk right out of the room and right into the sharps container. ...I was careless [before] and [now] I'm like: "Is there enough lighting in the room?" I know I only had one light on [before]. There's two lights in the room, they only

had one light on and so everything now, I have all, full blasting lights on and, you know, it's all about me making sure I do the best nursing care that I can possibly do because I see how easy it is to make a mistake, not just with needles, but with everything, everything and it's too scary. It's too scary so when I go in a room, I'm very focused. I know what it is that I'm going in there to do and I make sure I have a history on the patient before I go in there and I'll take the time and look up, if I don't get enough in report on somebody, I'll stop and just go into the computer real quickly to see where he's coming from. Yes, because it's chaotic there. It really is.

Sandy realized that safety was about more than simply taking care with needles. It was about being present in the moment as she provided care to patients.

Maria focused squarely on her own part in what caused her initial injury and helped facilitate introduction of protected lancets into her facility. She spoke about her efforts to prevent injuries similar to hers and to make co-workers aware that protected lancets were now available:

It was shortly around that time that they introduced the protected lancets. So I made sure that everything else was cleared out of the emergency box, because sometimes people would go and put other things back in there and it was always one nurse's job to make sure that that box was up to date and so I was always trying to make sure there was nothing that wasn't supposed to be. And, I did in fact, I remember saying that to a number of other people, "use the lancets that are protected" and taking the other ones off the shelf.

In frequently checking the emergency box, Maria assumed responsibility, not simply for her own safety, but also for the safety of co-workers who faced similar risk. After her first injury, Maria spoke about another positive aspect of her first PI experience – a heightened awareness of lifestyle issues that contributed to her safe and healthy in her work:

[need to] Just always to try and stay really rested and not go in tired, try and eat a good lunch, dinner, all that kind of stuff. Just maintain myself in a way so that I was working at maximum capacity and not feeling tired out of fatigue, stress or something.

Despite the support she acknowledged receiving from colleagues, Maria's second exposure left her feeling less connected to her organization. She did describe, however, being changed by the experience, feeling a need to be more vigilant and less accepting of potential risks. More than anything else, she came away from her experience feeling a clear sense of her own responsibility for taking action when change needed to occur:

It's changed how I feel about the organization I work with. I feel that I have to advocate for myself and I have to pay to attention if I have a concern about something to bring it forward and not expect that, oh that's the way it is. I feel like if there's a change needing to be made, you need to do what you can to make that change. I feel like I did what I could. I spoke with all the administrative people. I spoke with the guy at the TB clinic. I certainly spoke with all my colleagues at all the locations where I worked and said: "Don't use that anymore. It's not safe." ...There's plenty of other products and we shouldn't be using something questionable either. It's not just sharps, it's just the whole experience. I feel like nothing is perfect and it's never going to be perfect and we're all trying to do the best we can, but ultimately each one of us has to take responsibility to be an advocate for ourselves and our patients and our colleagues and it's like we have to take that responsibility. We can't slough it off on somebody else. It's not our supervisor's job to look out for us.

Cindy's reflections concerning her injury experience spoke not only to vigilance related to future handling of sharps, but also to changes she needed to make in other areas of her life:

I think it just me more cautious, not to the point that I'm neurotic about things, but I am

more careful about when I'm working with sharps, but being that sick when I was on the Vancomycin changed the way that I look at my life and I realize I'm working too hard, not spending enough time with my family and so I 'd have to say there's some positives that came out of it, because it made me reevaluate the way I was living my life, the way I was interacting with my family and I've always been healthy and active, but just the fact that I felt so lousy, couldn't even take my dog for a walk without getting short of breath, I felt I needed sort of to retaliate from that so I started running and I ran my first marathon a year later after the injury, kind of as a retribution, payback for myself.

In the aftermath of her injury, Cindy recognized the need to make changes in the way she was living her life. For her, the meaning of her PI was about realizing what was most important and rearranging her priorities.

For Cookie, like Cindy, vigilance was about taking an honest look at her life and her priorities and doing what was necessary to better care for herself. She shared what that involved for her after her injury and into the future:

In the end you had to take a deep breath and say you're going to be okay, but that you have to do what's right for you and that it doesn't matter what other people think or do, you need to do what's right for you. ...It just came back to saying you need to keep with the right people, keep with the right people and keep with the people that can support you, that no matter who your family is, no matter where you work, that you're the only one that can take care of yourself and you're the only one that can tell you who you need and what's going to help you the most and you know, taking a drive at 5:00 at night by the beach or going down the Cape just for like an hour or two hour drive, I would do that. One Sunday it was like 4:00 and I finally felt better and I just opened my sunroof and just drove down there. It was

great and I just sat on the beach in my chair. I just took out my chair and it was just, thank you, God. It was the simple things in life that came back to help me.

For Cookie, reflections and vigilance took her to a more spiritual level of awareness. In many respects, she uncomplicated her life and became more present in the moment following her PI experience. She had come too close to seeing how easily and quickly human existence can be threatened. Many months after her final negative serial test and still working as a nurse, Cookie spoke about some of the changes she'd made:

I stand up for myself more. I've slowed down and I've taken charge of my life there. I pursue things that I really want and I just don't let them just push me around and do whatever they need to do. ...I don't do half the overtime and I just live a little bit more simply. I'm happier. Yeah.

Cookie made another change. She transferred out of the OR she was in and joined another OR team, one with whom she had previously worked.

There was no question that Maggie became more vigilant and mindful in her use of sharps as a result of her experience. She spoke at several points about how angry she was at herself for doing something so inexcusable and envisioned doing the procedure again without placing her hand in harm's way. Maggie's experience also led her to reflect on awareness regarding another level of vigilance, not simply in relation to her own health, but that of her patients.

I think everything that happens in life has meaning. It happened for a reason. I mean that whole situation, I don't look at it as, poor me. I look at it, well as, what is the lesson I was supposed to learn in this and I guess what it did for me personally was just have a... know what it's like being on the other side. Not taking that for granted as much anymore. Like you entrust what you think are knowledgeable and educated and people, but that even

with all that, there's limitations and being on that other side it's different. It's really different and it's humbling and I think it happens because it's going to take me on a journey that I might not have otherwise gone on.

As a result of her experience, Maggie gained deeper insight and understanding of what it's like to be a patient – to be without control. In the process she believes she has become a more compassionate, understanding provider.

As an NP who had previously prescribed PEP with little appreciation for the severity of its side effects, Maggie also spoke candidly about changes that she believed needed to occur in order to improve post-injury care:

I really think we have more work to do in the healthcare system around it. We've come a long way and we've done a lot of great stuff and all the safety issues have been addressed pretty well. Even though we still hear about needlesticks, at least from my perspective in the emergency room, we don't have them at anywhere the rate we used to, but our response is still not what I'd like to see. I think given everything I've learned from it, it's not just a needlestick and quite frankly that was probably the smaller part of it. The bigger part was the response, the therapy, the follow up, all that stuff could be addressed in a much better way and it shouldn't be like, these meds can just upset you. These meds can literally knock you on your butt and you may not be able to go to work, not that that would have made me feel any better, but then I wouldn't have second guessed how I was feeling so much and hearing that and knowing that I would have just wrapped my head around it instead of trying to push through it the way I did. So yes, I think that aspect of it is not standard enough and uniform enough and not patient driven or patient sensitive enough as it could be.

Maggie's PI and PEP experiences affected her profoundly, not simply because they caused her to become so ill and so fearful, but because they made her question the health care system as a whole in relation to the way post-exposure care is delivered. It has also sensitized her to the complex needs of patients and health care workers who receive PEP.

Sarah spoke about the specific lessons she took away from her injury related to sharps:

Going back to work in general I definitely was super conscientious from that point forward for a really long time. I would like to say forever after that, but obviously after time you get a little bit, I definitely was really just conscientious about the way I would give injections and when I was dealing with needles in general and I think in retrospect the way I sort of evaluated the original incident was that I had just been distracted and either looked away or I'm definitely somebody who's really fast and I would never think that I was careless, but I pride myself on being able to do things in an efficient way, but I think in this case I'm sure it proves to me that that's not always the best.

In reflecting on the circumstances surrounding her own injury, Sarah is able to step back and bring an honest perspective to her own responsibility with respect to her PI. More importantly, she is willing to reassess the way she practices and efficiency might be better defined.

From a more existential perspective, Sarah spoke about meanings she attached to her injury. One was strictly personal, and the other, similar to what was shared by Maggie, had to do with care of her patients:

I think it meant a couple of things. It meant in my own, not mortality, maybe, maybe mortality, but just sort of that bad things can happen and I should be more careful in the same way that I think I still, even into our 20's I think we still have a sense of immortality or things can't touch us and more so actually now. I prescribe these medicines to my

patients and I think it's really lucky in a way that I can understand their side effects and try to relate or empathize in a better way and HIV is one those unique things where I can't certainly empathize with having a virus or anything like that, but in my management of my patients, I can try to understand how they're describing their symptoms and that's hard too, because I wouldn't want to suppose that they're feeling what I'm feeling, but I don't know, the question of disclosure sometimes I think comes up. Sometimes I think that it would be helpful for me to disclose. Sometimes I don't think it adds anything at all....

In the end, Sarah is left with a clearer understanding that non-being is a real possibility and that she needs to live her life in a way that honors that. And finally, like Maggie, she is left with a greater capacity for empathy and compassion, particularly with respect to her patients with HIV.

Summary of Phenomenological Meaning in Registered Nurses' Experience

Over a period of 18 months of phenomenological investigation utilizing van Manen's organizing framework of existential lifeworlds, this research has brought to light a better understanding of registered nurses' experience of percutaneous injury and its aftermath. Through concurrent processes of reading, rereading, writing, rewriting, discourse, and continuous reflection, meanings were uncovered in a part-whole dialectic process of seeking an understanding of what was revealed by the text.

Findings from this study emerged as three essential themes, which were derived from the data, constituted by dimensions, and substantiated by supporting thematic statements. The essence and primary mode of living with the sudden occurrence of percutaneous injury is identified as: *being shocked: The potential of a serious or life-threatening infection*. Three dimensions, *responding viscerally and emotionally, acting on the body to reduce contamination, and felling the urgency for immediate care* comprise the essence of the phenomenon.

The meanings of the experience of percutaneous injury and its aftermath for registered nurses in this study were captured in two other essential themes, *needing to know it's going to be okay* and *sensing vulnerability*. Two dimensions, *assessing risk*, and *seeking post exposure intervention and caring responses from others*, were identified as constituting *needing to know it's going to be okay*, the initial mode of living in the aftermath. The secondary mode of living in the aftermath, *sensing vulnerability*, was comprised of three dimensions that included: *facing the fragility of health*, *distinguishing supportive vs. non-supportive relationships*, and *being vigilant as necessity*. Together, these three essential themes and their dimensions represent the essence and meanings of percutaneous injury and its aftermath for at least one group of registered nurses in the northeastern region of the US.

Nurses experienced PI and its aftermath over time, as a temporal embodied experience involving a range of thoughts, emotions, and actions. They were shocked during the PI as they encountered the potential reality of their own health disruption. Both embodiment and temporality stood out as figural as they responded emotionally, acted on the body to reduce contamination, and felt the urgent need for immediate care.

Furthermore, as time elapsed, participants reflected on the nature of their injuries and became focused on needing to know that everything would be okay. Needing to know it would be okay reflects participants' awareness that things may not turn out okay if they experienced a deterioration in health status resulting from the PI. Risk assessment, post-exposure intervention and caring responses from others helped participants know it was going to be okay in the aftermath of PI. Supportive relationships became especially important to participants as they sought the reassurance they needed to know they would be okay.

Additional meaning of the aftermath of PI came as participants reflected on a newly perceived susceptibility to disruption of future health and interpersonal relationships. As the result of the lived experience, participants sensed vulnerabilities that caused them to become more vigilant in the time beyond the lived experience in relation to lifestyle choices, relationships and PI prevention. Social support helped participants cope with the vulnerabilities and distress associated with the PI experience. Vulnerabilities experienced in the aftermath of PI also helped them distinguish between supportive and non-supportive relationships within their communities and respective worlds. Finally, the necessity of being vigilant was identified by participants as an important means for reducing future health vulnerabilities.

Chapter 5

Discussion, Conclusions and Recommendations

In this final chapter, a discussion of phenomenological findings relative to registered nurses' lived experience of PI and its aftermath is presented. Findings, including essential themes and their dimensions, are discussed in relation to van Manen's existential framework, relevant research and literature, and recommendations for nursing education, practice, research and health policy. Consistent with van Manen's method, discussion of study findings will also include an exploration of thematic word definitions to provide further existential validation of meanings in this study as commonly used and articulated in the larger world.

Two research questions guided the conduct and findings of this study:

1. What are the major themes of the lived experience of percutaneous injury and its aftermath in relation to embodiment, space, time and relationship as perceived by registered nurses who have had the experience?
2. What are the subjective meanings that can be interpreted about the human experience of percutaneous injury and its aftermath as perceived by registered nurses who have had the experience?

Van Manen's Existential Lifeworld

The philosophical idea *lifeworld* (world of lived experience) (Husserl, 1952) provided the phenomenological grounding for the discovery and interpretation of meanings in this investigation. Human science research explores the structure of the human lifeworld – “the lived world as experienced in everyday situations and relations” (van Manen, 1990, p. 101) – from which phenomenological meaning is constructed.

Phenomenological philosophers Heidegger (1962) and Merleau-Ponty (1962) have written about phenomenological reality – human being’s being-in-the-world – as embodied conscious perception in the world. Embodiment makes clear that consciousness is the means by which humans are provided access to and are aware of being-in-the-world. The *being* is in lived experience and perception. Inherent in the lifeworld is that human beings, by their very nature, (being) experience reality, or have lived experience, via consciousness, embodiment, temporality, and relationships.

Van Manen’s phenomenological research method requires researchers to investigate lived experience as a way of being-in-the-world (van Manen, 1990). During the processes of existential investigation, phenomenological reflection, and phenomenological writing, thematic descriptive aspects and essence of the PI lifeworld or lived experience were discovered. Van Manen’s four lifeworld existentials – embodiment (lived body), relationality (lived relations), spaciality (lived space), and temporality (lived time) – served as reflective guides in the conduct and discovery of meanings in this study.

Discussion Related to the Essence and Meanings of PI and Its Aftermath

This phenomenological study of the PI experience represents seminal work and provides needed insights into the needs of injured nurses. With the exception of a few studies that pre-date the introduction of HIV prophylaxis, research conducted on this phenomenon in the US is primarily epidemiological and descriptive and more relative to the nature of underlying circumstances and the scope of percutaneous injury among health care workers, than to the human experience itself.

Three major themes emerged from phenomenological reflection and interpretation as the essential structure that captured the essence and meanings of the human experience of PIs and

their aftermath among registered nurses in this study: (1) *Being shocked: The potential of serious or life-threatening infection*; (2) *Needing to know it's going to be okay*; and (3) *Sensing vulnerability*.

Being Shocked and Constituting Dimensions

The first essential theme is: *Being shocked: The potential of serious or life-threatening infection*. The concept *being*, according to van Manen, always refers to “the being of an entity” (1990, p.175). Being-in-the world points to the manner in which humans “exist, act, or are involved in the world” (van Manen, 1990, P. 175). According to the Encarta World English Dictionary (1999), *shock* is defined as, “something surprising and upsetting” or “an unexpected, intense and distressing experience that has a powerful effect on somebody’s emotions or physical reactions” (p. 1654). The word *potential* is defined as: “possible but not yet realized” or “with a possibility or likelihood of occurring, or of doing or becoming something in the future” (Encarta World English Dictionary, 1999, p. 1408).

Being shocked: The potential of a serious or life-threatening infection captures the essence and primary way of being-in-the-world with PIs as they occurred. The shock of the PI and its potential to seriously threaten participants’ health evoked an immediate response and instantly shifted their focus to the injured body part. Dimensions that constituted *being shocked* included: *responding viscerally and emotionally*; *acting on the body (as object) to reduce contamination*; and *feeling the urgency for immediate care*.

Responding viscerally and emotionally. With respect to the first dimension, *responding viscerally and emotionally*, the Encarta World English Dictionary (1999) defines *responding* as “the body’s reaction to a stimulus; the reaction of an organism or any of its parts to a stimulus (p. 1528). *Visceral* is defined as “proceeding from instinct rather than from reasoned thinking” (p.

1985). *Emotion* is defined as “heightened feeling: a strong feeling about something or someone” or “agitation caused by strong feelings” from the latin *emovere*, literally meaning ‘to move out’ from *movere* (p. 586).

For nurses in this study, the meanings of the experience of the first dimension of *being shocked* – responding *viscerally and emotionally* – are represented in the aforementioned definitions in the following ways. Each participant indicated shock that was manifest by an instinctual and heightened emotional reaction to a stimulus beyond the physical boundaries of their own body. Language used by participants evoked sudden and intense alarm, anxiety, disbelief, and distress. The PI became the mechanism, and the wound a potential portal for the introduction and transmission of serious and potentially life-threatening bloodborne disease. *Being shocked*, and the potential threats that were part of the awareness in the moment of injury, brought physical, emotional, and spiritual distress immediately to the surface for participants.

Discussion of being shocked and related literature. Newton (1995) conducted a phenomenological study on nurses’ responses to occupational exposures to patients known to be infected with HIV. Interviews were conducted with 10 nurses from a convenience sample seen in the Employee Health Department in one hospital following their exposures to needlestick injuries (6), skin contact (1), and mucous membranes (3). Six themes were identified as representing the structure of the experience. The first identified theme, emotional impact, was characterized as shock and disbelief.

Other studies by Gershon, Flanagan et al. (2000) and Hills and Wilkes (2003) – which did not involve working with source patients previously known to be infected with HIV – also reported shock and acute stress reactions among 35 and 104 exposed healthcare workers respectively.

Findings in this study are supported by initial responses of nurses and healthcare workers to PIs in all three of these studies, adding to the current body of knowledge.

Anecdotal findings in the form of first person narratives and case reports also exist in the literature (Gershon et al., 2000; Henry et al., 1990; Howsepian, 1998; Seibert, 2003; Treloa et al., 1995; Wilmont, 2009; Worthington et al., 2003; Worthington, et al., 2006). One source in the literature providing a detailed and poignant description of the experience of a high-risk PI was written by Dr. Mahlon Johnson, an associate professor of pathology and biology from Vanderbilt University (Johnson, 1997). Dr. Johnson was one of the few pathologists in the country willing to conduct autopsies in the early 1990's on end-stage AIDS cadavers. After abandoning forceps that kept slipping from his fingers as he attempted to peel back the scalp from the skull, his bloody fingers suddenly lost their grip and "jerked into the path of the bloody scalpel (p. 5)." Dr. Johnson described his immediate shock and thoughts that went through his mind:

Suddenly, the splintering pain went right up my arm. The pain told me that the cut was deep, and for a second I stood there gasping at what I'd done. Then I saw my blood seeping out and slowly filling each layer of glove that, by now, was filled with AIDS blood. My hands felt clammy and wet, and with a pang of panic I realized that, through the puncture in the gloves, blood was meeting blood in my wounded hand (p. 5).

Dr. Johnson's horror was magnified, not only by his certainty of becoming infected, but also with thoughts of how little was known in 1992 about HIV and how to treat it.

While circumstance of his injury differed significantly from those surrounding exposures in this study, Dr. Johnson's initial response to his injury was not significantly different from participants in this study – a finding that suggests that *responding viscerally and emotionally* –

the first dimension constituting *being shocked*, the essence of PI in this study – is associated with the potential threat posed by PIs.

Acting on the body to reduce contamination. Definitions also help validate meanings interpreted with respect to the second dimension of *being shocked - acting on the body to reduce contamination*. *Acting* is defined as “taking action” (Encarta World English Dictionary, 1999, p. 15) and *contamination* is defined as “the impure state that results from becoming contaminated” (p. 391).

Acting on the body to reduce contamination, was manifest by nurses’ behavior immediately after a PI occurred. Participants’ actions shifted to a cognitive, problem-focused coping relative to the need they felt to do something to reduce blood contamination. All participants immediately washed or vigorously rinsed the injured body area and – despite the fact that no evidence exists to suggest it has any protective effect – several participants engaged in efforts to squeeze foreign blood contamination from the puncture site. These actions characterized *acting on the body (as object) to reduce contamination* as nurses attempted to reduce the likelihood that blood from the source patient reached their own bloodstream.

Discussion of acting on the body to reduce contamination and related literature. Two anecdotal reports in the literature provide similar accounts of actions taken following PIs. Badacsonyi (2001), an anesthesiologist in the UK, described the harshness of his reality when he experienced a “potentially fatal inoculation” (p. 373). Similar to actions taken by participants in this study, he turned his attention immediately to his injured finger, from which he “managed to squeeze a considerable amount of blood” (p. 373). He also sought immediate care in the Accident and Emergency area.

Wilmont (2009) was only months into her second career as a nurse when she stuck herself with a large-bore needle containing the blood of a patient infected with hepatitis C. In the moment her injury occurred – again similar to participants in this study – she described the shock she felt, saying: “I froze, breathless” (para. 4). Her next actions also sounded similar in nature, tone and urgency to those of participants in this study: “With some prompting from my colleagues, protocol kicked in. I sped to the sink, bled the wound, washed it with hot water and checked the patient’s record for HIV status” (para. 5).

Feeling the urgency for immediate care. *Feeling the urgency for immediate care* represents the third dimension constituting *bring shocked*, the core essence of PI. According to the World Encarta English Dictionary, *feeling* refers to “an instinctive awareness” (p. 652), which in this phenomenological theme was tied to *feeling the urgency for immediate care*. *Urgency* is defined as “the immediate need for action” (p. 1954). *Immediate* is defined as “without pause or delay” (p. 900). *Care* refers to “careful attention to avoid damage or error” (p. 274).

Nurse participants’ behavior demonstrated a need to immediately report and seek care for their injuries without delay, regardless of circumstances. All took the steps necessary to report injuries to supervisors and follow through on the need they felt for immediate care. Some sought care on their own; others did it at the urging of colleagues. In some instances, it was apparent that participants’ PIs were viewed as an inconvenience or annoyance by supervisors or co-workers. In several cases, it became necessary for injured nurses to advocate for themselves as nurse supervisors suggested post-exposure evaluation and care could be delayed until the end of the shift, indicating those supervisors’ lack of familiarity with the most up-to-date post-exposure care guidelines. According to the CDC guidelines (2005b), care should be initiated as soon as possible after an exposure. Urgency of immediate care is tied to the need for timely

administration of PEP that, if indicated, should be administered within one to three hours after an exposure.

Discussion of PI reporting and related literature. Each nurse participant in this study immediately reported and sought care for her injury. Findings from the research literature have consistently provided widely divergent estimates of PI reporting by US healthcare workers. Research conducted in recent years indicates that the problem of underreporting of PIs remains pervasive. Since 2004, a number of retrospective studies have been conducted that demonstrate reporting rates vary appreciably according to the occupational group (Gershon et al., 2005; Gershon et al., 2007; Lee, Botteman, Nicklasson, Cobden & Pashos, 2005; Makary et al., 2007; Sharma, Gilson, Nathan & Makary, 2009; Sohn, Eagan & Sepkowitz, 2004).

In her anecdotal report, Siebert (2003), an attending physician, reported hiding her injury that occurred during a lumbar puncture on a patient with end-stage AIDS from her resident. She continued with the lumbar puncture until it was completed and then described staring at her glove before removing it, and meticulously scrubbing her hands. Feeling a “desperate need to go home, kiss her kids” and “climb into bed with her husband” (p. 765), she did not immediately report her injury, but rather called a friend who was an ID consultant the next morning.

Underreporting rates cited among nurses in recently published studies ranged from 44 to 55 percent (Gershon et al., 2009; Gershon et al., 2007; Lee et al., 2005; Sohn et al., 2004).

Variability in reporting rates is attributed to many factors. In one pre- and post-intervention survey completed by over 820 health care workers in Manhattan who received mandatory training prior to implementation of the 2001 federal Needlestick Safety and Prevention Act, 55 percent of nurses failed to report their injuries in the two-year post-implementation period (Sohn et al., 2004). The three most frequently cited reasons for non-report in the study were low risk

PI, low risk source patients, and no time to report. Self-assessment of low risk potential was noted to play a significant role in non-reporting among all occupational groups.

Gershon conducted two recent studies to explore the risk and patterns of PI reporting among non-hospital registered nurses. The first involved the conduct of surveys, in-depth interviews, and focus groups with 160 nurses who had sustained a PI (Gershon et al., 2007). Despite the reported availability of post-injury emergency care by 89 percent of the nurses, and statements by 93 percent that they were encouraged to report, 49 percent of nurse respondents failed to report their injuries. The most common reasons cited for non-reporting included: reporting was too time consuming; being fearful of getting into trouble; wanting to keep the information confidential; and not knowing where to report. In contrast to Gershon's 2009 study findings, assessment of risk based on medical necessity was not cited as a major reason for non-reporting in this study.

Gershon's 2009 cross-sectional study of home care nurses examined risk factors for PI exposure. Fourteen percent of a convenience sample of 738 RNs reported one or more PIs in the prior three years. Approximately 46 percent of PIs were not reported for the same reasons cited in Gershon's previous study (2007), including fear of getting into trouble. In contrast to 2007 findings, nurses in this study also stated they did not report because it was not medically indicated.

Discussion of individual blame, PI reporting, and related literature. As indicated by past research, individual blame – or worry that an injury would be attributed to carelessness and that discipline could ensue – remains one of the factors that continues to account for underreporting. Even though all participants in this study did immediately report, many used language in the moment immediately after injury and in the months following to indicate self-blame, even when

circumstances surrounding an injury pointed to other contributing factors such as staffing, lack of appropriate equipment or training, or device failure.

Individual blame may be reinforced by others, as in Cookie's case when a nurse colleague in the OR screamed at her: "What did you do?" even though it was a surgical resident's carelessness that was clearly responsible for her injury. Evocative participant language in this study included: I stuck myself; I was careless; or, I saw what I had done, reflected self-blame and personal injury attribution. Based on past research, the issue of individual blame remains relevant with respect to the phenomenon of injury non-reporting, as it can lead to shame and inaction, as well as a tendency to conceal or compartmentalize an injury. What remains unclear from this study, given the fact that all participants reported their injuries – including those who blamed themselves – is, what factors accounted for the decision nurses in this study made *to report?*

While no research is currently available to bring greater understanding to the actual relationship between individual blame and underreporting of PIs, other related work provides additional insights that are helpful in examining the relationship between individual blame regarding injury or errors, and reporting behaviors. The sentinel work of two people, Drs. Lucian Leape and James Reason, has been integral to the movement of shifting away from a punitive focus on individual blame to examination of reforming systems in order to increase reporting and reducing the incidence of preventable patient injury and medical errors.

In September of 1999, the Institute of Medicine (IOM) issued a groundbreaking report entitled: *To Err is Human: Building a Safer Health System*, creating a major paradigm shift relative to prevention of medical error. In testimony before a Senate subcommittee, Leape stated: "Approaches that focus on punishing individuals instead of changing systems provide

strong incentives for people to report only those errors they cannot hide. Thus, a punitive approach shuts off the information that is needed to identify faulty systems and create safer ones. In a punitive system, no one learns from their mistakes” (Leape, 2000). Unfortunately, for patients and health care safety, adoption of system-wide reforms has been slow to occur in the US.

James Reason, a British professor of psychology, has developed a related organizational concept which he calls just culture. A no-blame culture, according to Reason, is neither feasible, nor desirable. Trust is a key element of any reporting or safety culture, which in turn requires the existence of a just culture. Just cultures possess a collective understanding of boundaries between what constitutes acceptable and unacceptable risk behavior and are considered by Reason to be an essential early step in the process of building a safety culture. Therefore, a just culture represents an intermediate component between patient safety and a safety culture.

Reason also states:

In almost every kind of hazardous work, it is possible to recognize typical accident patterns. That different people are involved in these events clearly implicates causal factors relating to the workplace and the system at large. Local traps, involving error-provoking tasks and work conditions, have the power to lure people into repeated sequences of unsafe acts (1998, p. 294).

Individual blame continues to be prevalent within workplace cultures with respect to PIs. Foundational elements and principles relative to safety and just cultures, created to support and promote reporting of patient injury and error – and to shift focus away from individual blame – are also relevant to the issue of PI reporting. At the same time, because available research on PI

reporting is largely descriptive, little understanding currently exists with respect to why one individual reports an injury and why another doesn't.

It was apparent that the nurses in this study viewed reporting as a necessary step prior to seeking care for their injuries. Reporting behaviors among participants in this study differed from what has been previously described in the research and literature. While this study involved a limited number of PI experiences, 100 percent reporting is inconsistent with what has been described as in the literature with respect to this phenomenon. Self-selection is likely to have played a significant role in the reporting anomaly among participants in this study. In this study, it was also apparent that the perceived threat to their body and their health was, at least in part, a motivating force behind their behavior, even for those who blamed themselves for their injury. Findings of this study and previous research, however, do little to provide a clear understanding of PI reporting behaviors and motivations.

Based on a review of the findings of this study and the current research and literature, it does appear that *being shocked: the potential of serious or life-threatening infection* accurately reflects the core essence and meaning of the PI experience. Dominant existential themes relative to *being shocked* are discussed in the next section.

Lifeworld existentials related to *being shocked*. Embodiment was a dominant existential with respect to *being shocked*, the essence of PI. In the shocking moment of injury, the nurse's body became an entrance point for possible infection transmission as skin barriers were breached by the puncture, and the reservoir in which the threat of infection could take hold. Percutaneous injury represented a sudden, radical departure from a world that, in the moment prior, had been safe and secure. Before their injury, good health had been largely taken for granted. Several

nurses in the study described a surreal quality to the moment of injury as if they were removed from their body and observing the event as an outsider.

Temporality also emerged as nurses' thoughts in the present projected them to the future and to a world of living with a serious or life-threatening infection. *Being shocked* meant being thrown into a new and frightening world reality with which none of the participants felt prepared to encounter and experience. For some nurses like Hillary and Cookie, temporality was also reflected in nurses' actions following the moment of injury, as *being shocked* distorted their perception of time and persisted beyond the moment of injury.

Relationality emerged as another relevant existential with respect to *being shocked* as each nurse attempted to separate herself from the other as demonstrated by efforts directed towards washing, rinsing, and removing another's blood from her own body. Relationality is also apparent in *being shocked* as injured nurses turned to others for support in the urgency of their need for immediate care.

Needing to Know It's Going to Be Okay and Constituting Dimensions

The two themes *needing to know it's going to be okay* and *sensing vulnerability* capture the meanings of the human experience of PI and its aftermath for registered nurses in this study. *Needing to know it's going to be okay* is identified as the initial meaning and mode of living in the aftermath of PI and is constituted by two dimensions: *assessing risk* and *seeking post-exposure intervention and caring responses from others*.

According to the Encarta World English Dictionary (1999), *needing* is defined as "something is required in order to have success or achieve something" (p. 1210). The word *okay* is defined as: "being in good health or condition" (p. 1257). *Assessing* is defined as "a judgement about

something based on an understanding of the situation” (p. 101). *Risk* is defined as “the chance of something going wrong” or “the danger that injury, damage or loss will occur” (p. 1546).

Seeking is defined as “to consult with somebody in order to obtain something such as help or advice” (p. 1622). *Intervention* is defined as “an action undertaken in order to change what is happening or might happen, especially in order to prevent something undesirable” (p. 1940).

Caring is defined as “being compassionate” or “showing concern for others” (p. 275).

Responses is defined as “something done in reaction to something else” (p. 1528). Together, these definitions provide further existential validation of meanings commonly used and articulated in the larger world relative to *needing to know it’s going to be okay* and its dimensions.

In this study, injured nurses expressed a *need to know that it’s going to be okay* with respect to the potential health threat not being realized. Following the moment of injury when participants experienced shock related to the potential for a contracting a serious or life-threatening infection, the nurses in this study engaged in a course of action of that they hoped would help them know they would be okay – first by engaging in a process of risk assessment relative to their exposure, and second, by seeking immediate intervention and reassurance from others – particularly clinicians with occupational health expertise.

Assessing risk. Prior to being seen by expert clinicians for their injuries, the process of assessing injury risk began with the participants themselves. It was not unusual for the nurse, even before being seen, to begin the process of assessing and seeking additional information from and about the source patient. Injury risk assessment was also performed by the expert clinician(s) who explored and provided information relevant to the injury through history-taking and testing. In order to feel more reassured, nurses sought additional information to help them

begin to put their injury and the threat associated with it into perspective. At the same time, several participants spoke about the difficulty they had, while still experiencing the shock of their injury, taking in and processing information provided during their initial visit to the occupational health clinic or emergency department. Participants also needed additional time beyond the initial post-exposure care visit to begin feeling reassured.

Seeking post-exposure intervention and caring responses from others. Percutaneous injury forced participants to look beyond themselves for help. In addition to dealing with the burden of their anxieties, it became necessary for participants to focus their energies on seeking assistance, information, and support from others. For many participants, it meant a loss of control – being on the patient instead of provider side of care. Post-exposure intervention in the form of testing, information-sharing, counseling, and exploration of treatment options and plans was sought out by all participants. In reflecting on this part of the experience, nurses spoke about several things, including the importance and reassuring nature of knowledgeable, up-to-date caregivers and post-exposure protocols. It also became apparent, in several instances, that the lack of an existing or up-to date PI policy and procedure compounded the distress of participants.

Post exposure intervention as well as caring responses from others helped nurses know they were going to be okay. Participants also came to understand the importance of attentive, caring support throughout the entire period of this journey.

Discussion of assessing risk, difficulty feeling reassured, and related literature. One important finding related to the risk assessment process was that information provided by occupational health and emergency physicians, including initial source patient test results, did not universally reassure participants. Injury-related anxiety and stress were still evident long beyond the initial testing period for nurses whose exposures involved serial testing, taking PEP,

and/or source patients known to be HIV or hepatitis positive. Prolonged periods of uncertainty following the PI related to health outcomes contributed to the stress and anxiety associated with injuries. In contrast, participants whose exposures were assessed as low risk, and for whom no further testing was recommended beyond the initial source patient testing, appeared completely reassured.

Detailed personal narratives again provide rich insights into the lived experience and meanings associated with the aftermath of PIs. Badacsonyi (2001) described the comfort he experienced in his encounter with an HIV consultant “who explained to me the facts regarding risk, drug therapy and its possible adverse effects, future HIV testing, and also invited me to air any emotions that were worrying me” (p. 373). He also spoke about “the disconcerting uneasiness” he felt despite being well-informed about the low likelihood of seroconversion and experiencing the reassuring support from colleagues and providers who listened to what he was feeling and shared similar experiences with positive outcomes:

Again I am reminded that my cause of concern is almost more a theoretical than a real one, and yet I feel a disconcerting uneasiness. It appears to me that the overall effect of such an axiogenic event is the product of two variables: the likelihood of the worst-case scenario actually occurring (very small) and the repercussions should it actually happen. I think this second variable is immeasurably large. Hence, no matter how small the first variable, my overall feeling of worry is undeniable, and when I consciously remember it, disturbing despite its likelihood (p. 373).

Reminiscent of statements made by Maggie and others in this study, facts lose out to fear in the aftermath of PIs. Similar to participants in this study, all of the nurses in Newton’s study described engaging in a cognitive process of assessing the magnitude of risk and of examining

the potential ramifications of contracting HIV. Siebert (2003) also described the well-meaning, but largely ineffective reassurance provided to her by a friend and infectious disease consultant in the form of infection transmission probabilities: “Gently, he recited the statistics and reported that my risk for seroconversion was 3 in 1000. He was encouraged. I had been hoping for 1 in a million” (p. 765).

Lazarus and Folkman’s transactional theory (1984) relates to understanding of the psychology of stress and its cognitive appraisal. This theory conceptualizes stress as a result of a person’s understanding of the meaning of a particular situation. Stress is defined in relation to person and environmental attributes which ultimately influence the process of cognitive appraisal. Appraisal construction depends on what is at stake for the individual in relation to the particular encounter or event. According to Lazarus and Folkman’s theory, primary appraisal involves one of three judgments related to a stressor, including that it is: (a) irrelevant; (b) benign-positive; or (c) stressful. Appraisal of a stressor, which clearly applies to the PI experience, involves judgment as harm/loss, threat, or challenge. That judgment, according to transactional theory, generally correlates with reality. As indicted by findings in this study and other related literature, PI as stressor is appraised as threat, which, based on the statistical likelihood of infection transmission, has little to do with reality.

Discussion of uncertainty stress and related literature. The uncertainty literature adds another relevant perspective for consideration of findings in this study related to the aftermath of PIs. While information related to injury risk assessment was available to nurses in this study, there is no doubt that uncertainty stress existed related to unknown test results and health outcomes, and that uncertainty stress contributed to nurses’ level of fear and anxiety following PIs. Participants were left in a diagnostic limbo awaiting results for periods sometimes lasting

days, weeks, or even months beyond their injuries to learn whether they had been infected as a result of their exposure. All sought reassurance and social support as means of coping with the distressing nature of PIs.

The role of uncertainty as one of the conditions producing a stress response in illness has been studied extensively by Mishel and others (Hilton, 1988; Hilton, 1992; Lauver, Kruse, & Baggot, 1999; Mishel & Braden, 1984; Mishel, 1988; Wonghonkul, 2000). According to Hilton (1992), uncertainty is “a cognitive state created when an event cannot be adequately defined or categorized due to lack of information” (p. 70). Mishel and Braden (1988) argue uncertainty has four forms: “ambiguity concerning the state of the illness; complexity regarding the treatment and system of care; lack of information about the diagnosis and seriousness of the illness; and unpredictability as to the course of the disease and prognosis” (p. 98).

Watchful waiting, conceptualized as uncertainty associated with the meaning of a newly diagnosed illness or health trajectory against the backdrop of chronic illness, also constitutes anticipation under a situation of harm, threat or challenge. In any of these scenarios, as well as for nurses in this study who sought care following PIs, the injury context undoubtedly involves uncertainty for the affected individual. Growing interest in the coping responses of individuals faced with uncertainty related to a threatening event has developed over the past 20 years. However, this aspect of uncertainty-related stress is only briefly addressed as event uncertainty by Lazarus and Folkman (1984), primarily in relation to the notion of threat or risk probability and the potential for uncertainty to impact coping processes – and not at all in Mishel’s extensive body of uncertainty research (Mishel, 1988; Mishel, 1990; Mishel, 1999; Mishel & Braden, 1988; Mishel & Sorenson, 1991).

For nurses in this study, PIs represented an active threat based on their potential to jeopardize individual health and future. Participants' appraisal of the PI threat, as previously discussed, was based less on the statistical likelihood or an assessment of risk based in fact, than the visceral and emotional response to the potential threat associated with it. Similar to the physicians who provided first-hand accounts of their experiences in the literature – and who could typically be considered objective and evidence-based in their professional judgments – nurses in this study projected themselves into a future overwhelmed by thoughts of infection and disease – and, as noted by Badacsonyi (2001), identified concerns more theoretical than real.

Nature, extent and duration of psychological distress following PI and related literature.

Participants with exposures that involved a patient known to be HIV or hepatitis positive, but who were assessed by experts as low risk based on other injury circumstances such as the gauge of needle or depth of percutaneous injury, were much more difficult to reassure following their injury. In those cases, statistics proved totally ineffective in reassuring participants. Maggie captured the concerns she and others felt under those circumstances: “You could have told me the statistics until the cows came home. That wasn’t going to change anything because I’m like... I can be that one person. It just didn’t change anything.” For participants like Maggie, peace of mind came only upon completion of PEP and the final serial lab results. Consistent with available research findings (Gershon, Flanagan et al., 2000; Hills & Wilkes, 2003; Newton, 1995), testing was described by participants in this study as an ultimate source of both comfort and fear –confirmation of negative testing was identified as a key means for resolving anxieties. It was also apparent in the research and for participants in this study that the time involved in waiting for test results – both initial and serial – represented a particularly anxiety-provoking period.

While reports of psychological distress in this study as well as currently available research is significant – particularly among nurses and healthcare workers who are exposed to high-risk source patients – the nature, extent and duration of PI-related distress has not been well studied and is poorly understood. Most nurses in this study experienced a quick resolution to PI-related fears and stress based on reassurance provided by final testing. However, several participants described and demonstrated anxiety and sadness that persisted many months beyond completion of final testing. There is some evidence in the literature to suggest that PI-related stress and symptoms may persist beyond final testing, particularly for nurses exposed to high-risk patients.

Worthington, Ross and Bergeron (2006) reported two cases of post-traumatic stress disorder (PTSD) in nurses exposed through separate PIs to a high-risk patient. Following their injuries, both nurses received immediate care and counseling. While neither nurse had a prior history of psychological problems or seroconverted following their PI, both were reported to have suffered persistent depression, anxiety, insomnia and nightmares many months later. Both were diagnosed with PTSD by psychiatrists. Attempts by either nurse to return to the workplace where their injury occurred precipitated panic attacks up to two years after their injuries.

With the exception of this isolated case report and one other (Howsepien, 1998), long-term follow-up following PI is absent from the research literature. These findings, as well as findings from this study, point to the need to gain a better understanding of the potential for significant psychological distress to be experienced in the aftermath of PIs – particularly those involving high-risk exposures.

Discussion of the burdensome nature of PEP and related literature. Experiences with PEP in this study were especially burdensome for all five participants who were prescribed them in this study. Every nurse described not feeling prepared by occupational health or emergency

department clinicians for the extent and nature of the side effects encountered while taking the drugs – including NP participants who had previous experience with prescribing them for patients. All reported not being given information that would have helped them feel more prepared – several participants reported that discussion of side effects was presented in almost a cavalier fashion. Many participants did not receive follow-up that addressed their physical needs, particularly those nurses who suffered in isolation as they struggled to take PEP as prescribed. Most felt left on their own to manage difficult side effects on a day-to-day basis, and with the exception of one participant, none were unable to continue working while taking PEP due to their severity of side effects. Excessive fatigue that interfered with even the most basic daily functioning was of particular concern for nurses taking PEP.

In-depth description of the PEP experience following PI in the literature is limited to a handful of studies (Parkin, et al., 2000; Swotinsky, Steger, Sulis, Snyder & Craven, 1998; Wang et al., 2000). In each study, adverse events and side effects associated with PEP increased as additional drugs were added to combination therapies. In one prospective study (Swotinsky et al., 1998), 47 percent of workers were unable to complete the recommended 28 day course of PEP because of the severity of side effects.

Henderson (2001), a deputy director for clinical care at NIH with expertise in prevention of occupational exposures to bloodborne pathogens, raised several concerns about prescribers of PEP. Among his most serious concerns was that occupational medical personnel and emergency department providers have limited experience with the drugs and their toxicities. Potential implications for injured nurses and other healthcare personnel, as was the case for participants in this study, relate not only to a knowledge gap that results in inadequate preparation for those

prescribed PEP, but also a failure to appreciate the importance of close monitoring and follow-up whenever PEP is prescribed.

Discussion of the importance of social support and related literature. Emphasis was placed by all participants on the importance of social support throughout the PI experience. Nurses sought information and reassurance from those within their professional community and social networks including family, co-workers, colleagues, and significant others. Caring reassurance and social support helped participants get through their PI experience. Some had easy access to support; others found it less accessible. An absence of support or concern from co-workers, in particular, made the experience more distressing for participants, engendering a heightened sense of loneliness and abandonment. Despite their need, nurses also found it difficult to ask for help from others. Finally, in reflecting on their PI experiences and the role they were forced to assume as patient, participants described feeling a deeper sense of understanding and compassion, particularly as they resumed their role as care providers.

The stress-buffering effect of social support has been well-established in the research literature. The value of social support and caring reassurance in the PI experience was consistently described by nurses in available studies (Gershon et al., 2000; Hills & Wilkes, 2003; Newton, 1995) as well as in this study. Informational and emotional support was desired throughout nurses' experience. When support was not made available, all nurses described feeling lonely and abandoned. The type of support required among study participants varied according to the individual and the duration of need.

The temporal nature of the essential themes in the aftermath of PI is important to consider, as participants' need for reassuring, caring responses related to their PI experience didn't usually exist beyond final test results – which in this study were all negative. There was one major and

consistent exception, however, involving a clearly articulated need by participants for some form of acknowledgement by co-workers and immediate supervisors of their injury and the ordeal they had been through. If such acknowledgment had not occurred prior, participants expressed a need for it beyond the time when testing had been completed.

Acknowledgment of exposures by managers and supervisors was also confirmed by past research as an important issue for injured workers. One ethnographic study of 204 workers described the positive impact of supervisor support on a construction worker who returned to the job 8 weeks after suffering a serious foot injury requiring surgery: “He was constantly, you know, asking if I was alright...They wanted me to come back to work...they treated me just great...” (Strunin & Boden, 2000, p. 377). Other worker comments stressed the key nature of supervisor responsiveness and concern for employee welfare in the setting of an injury or high-risk health and safety situation. Workers described similar sentiments in the setting of a supportive supervisor, using common language such as: “caring,” “concerned,” “positive,” “validating,” or “understanding” (Hislop & Melby, 2003; Newton, 1995; Shaw, Robertson, Pranky & McClellan, 2003; Strunin & Boden, 2000).

Consistent with prior research findings, it mattered to participants in this study that nurse managers or an immediate supervisor made mention of their injuries after they occurred. More importantly, lack of acknowledgement both by co-workers and immediate supervisors was interpreted by study nurses as an indication that caring and support were lacking.

Lifeworld existentials related to *needing to know it's going to be okay*. Existentials revealed in conjunction with the initial mode and meaning of living in the aftermath of PI included embodiment, relationality and temporality. Embodiment remained central to their lived

experience as participants sought information to reassure themselves that bodily threats – including their worst fears related to health – would not materialize as a result of their exposure.

Relationality and temporality also emerged as existentials as injured nurses sought support, information and reassurance from others in their world that their future life – and the life of those most connected to them, particularly their children – would not be damaged or negatively impacted. The information and reassurance provided by others in their world helped them cope with the difficult emotions and frightening potential health threat they faced.

Sensing Vulnerability and Constituting Dimensions

Sensing vulnerability, another meaning and the secondary mode of living in the aftermath of PI, is constituted by *facing the fragility of health, distinguishing supportive vs. non-supportive relationships, and being vigilant as necessity*.

According to the Encarta World English Dictionary (1999, p. 1631), *sensing* refers to “the ability to appreciate something” or “to detect and identify a change in something.” *Vulnerability* is defined as being “open to emotional or physical danger or harm” (p. 1993). *Fragility*, defined as “the inability to withstand severe stresses or strains” (p. 711), was associated with health vulnerability. With respect to supportive vs. non-supportive relationships, *distinguishing* is defined as “recognizing differences (p. 522). As watchfulness, *vigilance* is defined as “the condition of being watchful and alert, especially to a danger” (p. 1980). *Necessity* is defined as “something that is essential, especially a basic requirement” (p. 1209).

For nurses in this study, the theme *sensing vulnerability* and its dimensions are represented by all these definitions. Unlike *needing to know*, *sensing vulnerability* is not limited with respect to duration or time after the injury. In this mode of living in the aftermath of PIs, participants

identified a susceptibility, both real and perceived, to the disruption of health and interpersonal relationships into the future.

Facing the fragility of health. As a result of their PI experience, participants reflected on the vulnerability they now felt relative to present and future health as well as social relationships. Having good health in the present or future was no longer taken for granted by participants. Past and present transformed awareness and consciousness of the future. Disruption of health occurred in the past and present for those taking PEP. All participants spoke about new awareness the PI experience raised relative to their mortality and to health risks posed by the work of nursing. Participants spoke about the value they attached to supportive relationships that helped them cope with the PI experience – and the sadness, anger and disappointment they felt concerning relationships that provided little or no support during this difficult period in their lives. For some, the PI experience was transformative – what happened to them changed behavior and awareness into the future. Injuries and the threats they posed, even though not realized, demonstrated to participants the necessity for being vigilant into the future to safeguard their health and prevent similar threats.

Discussion of vulnerability of health and related literature. As a direct result of their experience, participants universally reflected about the fragile nature of health. All participants openly acknowledged the potential created by their PI for deterioration of future health and the risks posed by the work of nursing. For some, it was admittedly the first time they had considered the possibility of future health disruption or their own mortality. Nurses prescribed PEP were particularly thoughtful concerning the impact of the PI on their health, both in the present and in the future should disease occur. All described how debilitating and challenging it was to tolerate PEP side effects and, for some, to complete the prescribed regimen.

Concern and considerations related to future health vulnerability also extended from participants to those around them. Nurses spoke about adopting healthier lifestyles in an effort to protect and preserve their future health, and about advocating for co-workers in the event health was placed at similar risk by unsafe working conditions. As they projected themselves into a future, they also spoke about the potential impact illness would have on those closest to them – especially their children.

Badacsonyi makes reference in his narrative to the temporal nature of these injuries: “An accident is complete in a split second, yet the consequences cause months of worry on the scale of life, loved ones and the future” (p. 373). Framed as the ‘what ifs’ (p. 130), exposed nurses in another study (Newton, 1995) described visualizing what their future – and that of their children – would be transformed into should they become HIV positive. Siebert (2003) was also projected into a future distorted and threatened by illness. She spoke about the emotional burden of her exposure and how easily she became overwhelmed, more than a day later, by thoughts of disease and a future drastically changed by HIV (p. 765):

Finally at home, my girls gave me their customary welcome mauling and then ran into the backyard to finish some sandbox creations. As soon as I made eye contact with my husband, I burst into tears. He tried to comfort me, but I would have none of it. The events of the day and my own imaginings of the worst possible conclusions to this incident squashed my usual optimism. That night, when putting my daughters to bed, I hugged them tighter and longer than usual that evening. I imagined how HIV would affect my family. I calculated how old they would be when I began to suffer the ravages of the disease. Would I embarrass them? Would I be a burden? Would they forget how vital and energetic I used to be?

Distinguishing supportive vs. non-supportive relationships. Vulnerability also loomed large in the present as participants desired and drew support from those around them following their injury. Social support helped nurses cope with the vulnerability and distress associated with their PI experience. Participants' sense of connection to others in their world in the present was also tested, and, in some cases, disrupted as their need and desire for support, caring and reassurance was not met. In that respect, the experience of PI and its aftermath helped participants distinguish between supportive and non-supportive relationships within their communities and respective worlds.

Being vigilant as necessity. Participants in this study moved into the future changed as a result of their lived experience. Following their PIs, participants sensed vulnerabilities that caused them to become more vigilant in the time beyond the lived experience. For some, vigilance involved a heightened awareness of health vulnerability and led to reflections about future injury prevention and increased caution and presence when working with sharps. Others shared a more existential perspective in relation to the connection they made between their injury, and their future lifestyle and relationships. Finally, the necessity of being vigilant was identified by participants as an important means for reducing future health vulnerabilities.

Discussion of vigilance, advocacy and related literature. The importance of vigilance and the need to care for self and others were revealed as common understandings gained by participants in this study. For some, that meaning was limited to activities directed towards preventing future injuries. Reutter & Northcott (1994) described a major coping strategy employed by nurses caring for AIDS patients in the early to mid-1990's as 'making the risk manageable' (p.54). Not unlike participants in this study, nurses achieved a sense of control

through adoption of strategies that allowed them to reduce and tolerate uncertainty. One strategy included efforts to maximize safety through the consistent use of precautions – a strategy associated with vigilance among participants in this study. This second strategy represented a more commonly identified thread in the face of serious workplace injury risks – reappraisal of risk by reinterpreting it as minimally threatening (Hills & Wilkes, 2003; Rodham and Bell, 2002; Strunin & Boden, 2000). Such a strategy is dangerous, as it is likely to contribute to a lack of reporting as injuries assume an unhealthy familiarity and become viewed as a normal part of the workplace experience.

Badacsonyi finishes his personal account with reflections related to the importance of support, compassion, and competent guidance in addressing future needs of colleagues who shared a similar fate (p. 374):

I was fortunate in at least one respect to be referred to a supportive and sympathetic HIV consultant who guided me skillfully. Perhaps these issues (including the option of supportive counseling) should be considered and maybe even included in a further updated new post-exposure protocol design.

Nurses in this study also emphasized having personal accountability for taking action to initiate changes to improve health and safety conditions in the workplace. Consistent with that understanding, after their injuries participants acted to update protocols and/or advocate for safer devices within their practice areas. Several nurse practitioner reflected on changes that needed to occur within the health care system relative to PI and PEP prescribing practices and follow-up.

Meanings for the future. In the aftermath of PIs, participants reflected on their injuries and considered the meanings their experiences held for them. As they reached a clearer understanding of their injuries, participants were able to transcend the difficult and emotional

impact of PIs and look beyond the actual experience to meanings their injuries held for the future. One finding in this study relative to *sensing vulnerability* was the variability evident among the depth and scope of reflections from participants in the study. For nurses whose PI experience was concluded within a relatively short time following initial source patient test resulting and a low risk assessment, reflections tended to be limited to considerations relative to vigilance, future injury prevention efforts, and the responsiveness of colleagues as well as management to their needs for reassurance and acknowledgment of their PI experience.

Among participants who experienced a longer period of time before final closure was brought to concerns about PI-related health outcomes, reflections about meaning and understandings of the PI experience extended to reassessment of life priorities and a deeper consideration of other life-encompassing considerations. Finally, based on accounts participants shared of being repeatedly approached by other nurses who had also had a PI, it was apparent that many nurses still had a need to talk about what they had experienced in the past. For participants in this study, these interviews represented the first time they had shared, in their entirety, their emotional PI experiences and reflections with another person.

Based on the interpretation of experiences described by participants and definition of key thematic terms, the themes *needing to know it's going to be okay* and *sensing vulnerability* and their dimensions reveal meanings of PI and its aftermath.

Lifeworld existentials related to sensing vulnerability. Existentials revealed in conjunction with *sensing vulnerability*, the secondary mode and meaning of living in the aftermath of PI, include embodiment, relationality and temporality. Embodiment remained central to participants' lived experience as concerns related to health were brought to the forefront. Health vulnerability was experienced in the past and present by nurses who suffered illness due to PEP.

The potential for future health vulnerability was discussed by all participants, both in relation to the risks associated with work of nursing, but also as participants considered a life impacted by HIV and/or hepatitis.

In addition to embodiment, relationality and temporality were also relevant to the discussion of *sensing vulnerability*. Relationality became central as nurses' PI experience allowed them to distinguish supportive from non-supportive relationships. Injured nurses sought reassurance and support from co-workers, colleagues, supervisors, friends and family. In some cases, support was evident. In other cases where support was desired but not forthcoming, nurses expressed sadness, anger and disappointment. Temporality came to the forefront as perceived vulnerability projected participants from past and present into the future relative to health, relationships and lifestyle. Nurses spoke about lessons learned as a result of their PI and moved into the future with a heightened level of commitment to vigilance related to workplace injury prevention, making healthy lifestyle changes, and finding time for relationships they valued most.

Summary of Conclusions Related to the Essence and Meanings of Registered Nurses'

Human Experience of PI and Its Aftermath

In summarizing conclusions that can be interpreted about the essence and meanings of human experiences of PIs and their aftermath, the key point is that this study represents the first substantive scientific understanding of the human experience and meaning of PIs and their aftermath. Findings in this study and related literature, lead to the overall conclusions that the essential themes *being shocked*, *needing to know it's going to be okay* and *sensing vulnerability* accurately reflect the essence and meanings of the human experience of PI and its aftermath. Interpretation of data from this study, along with findings from the literature, also support the

conclusions that these injuries impose a significant burden on nurses, and that the extent and nature of PI-related coping response is individually determined.

Findings from the research and related literature are consistent with findings in this study relative to the first two dimensions of *being shocked*. One major difference between results in this study and previous research is that all participants in this study immediately reported and sought care for their injury. In contrast, findings from research conducted in recent years indicate that the problem of underreporting of PIs remains pervasive. Based on these findings, it is concluded that (1) current understanding of factors that motivate nurses and other health care workers to report PIs is inadequate. It is also concluded that (2) individual blame, rather than a system perspective relative to the incidence and prevention of PIs, remains prevalent in health care. Another conclusion relative to *being shocked* is that: (3) the lack of existing or current policy and procedures for PIs, as well as a lack of familiarity with current recommendations among immediate supervisors and providers, had the potential to undermine timely reporting as well as the quality and confidence in post-exposure care provided to injured nurses.

In summarizing conclusions related to *needing to know it's going to be okay* and *sensing vulnerability* – the meanings of PI and its aftermath – the first is that: (1) reassurance and social support was valued and desired throughout the experience, particularly from co-workers. Another conclusion reached and supported by the literature is that (2) participants had a universal desire for some acknowledgement of the injury by management or immediate supervisors. Lack of support and/or acknowledgement following injuries contributed to participants' sense of isolation and abandonment.

While the processes of risk assessment and providing reassurance were important in the care of all injured nurses, it was concluded that (3) only test results provided the final reassurance and

closure most participants needed. It is also important to note, that (4) participants whose exposures involved a patient known to be HIV or hepatitis positive, even in the face of an otherwise low risk assessment based on other injury circumstances, were much more difficult to reassure. In those cases, sharing information in the form of transmission risk statistics proved a totally ineffective tool for providing reassurance. Those nurses needed additional time beyond the initial post-exposure care visit to begin to process information and feel reassured. Prolonged periods of uncertainty following the PI also contributed to a heightened level of stress and anxiety for participants. For those nurses like others, however, serial testing provided the ultimate source of comfort and reassurance. It was also concluded that (5) follow-up testing periods were found to be an especially anxiety-provoking period for participants. As a rule, however, support was not needed beyond final serial testing.

Related to post-exposure intervention, it is concluded that (6) participants were not adequately prepared in advance for the nature and extent of PEP side effects and all needed help to cope with and complete their drug regimens. Another conclusion related to participants' desire to contribute to health and safety relative to PIs. It was concluded that (7) participants perceived future vulnerability to PIs as a result of their experience, and that (8) participants welcomed and sought out opportunities to engage in advocacy efforts related to future injury prevention. It is likely that advocacy efforts as well as vigilance directed towards PI prevention contributed to restoration of some sense of control for injured nurses after their injuries.

The final conclusion of this study was that (9) nurses needed to tell their stories following the experience of PIs. For many participants, the study interview was the first time they spoke in any detail about their PI experience with another person. Participants all remarked about the value they attached to the opportunity to give voice to their experience, to reflect on its

meanings, and to share their experience with others. All did so with the hope that a better understanding of the PI experience would help inform those who care for health care workers following PIs or help ease the journey for those who travel a similar road.

Recommendations

Nursing Education

The need for curriculum development to enhance nursing students' understanding of the prevention and experience of all occupational injuries, including PIs, is a critical one in a health care system that continues to pressure nurses to work faster with sicker patients and fewer resources. Nurses should enter their professional practice with a clear understanding of the occupational risks posed as well as the protections and rights legally afforded them with respect to worker health and safety, including prevention of PI. Nursing education should arm nurses with the information they need to respond appropriately when a PI does occur. At a minimum, that information would include best practices with respect to prevention of bloodborne pathogen transmission, employer obligations with respect to provision of safety devices and equipment, healthcare workers' rights related to health and safety in the workplace and current CDC guidelines for post-exposure care. In addition, it would be ideal to promote an understanding of the lived experience of PI, so nurses are better equipped to respond and understand the needs of co-workers when injuries do occur. Curriculum for nurses who pursue advanced education in occupational health must also promote a better understanding of the human experience of PI. Occupational health curriculum also needs to include information that educates practitioners regarding the potential nature and extent of PEP drug side effects.

Nursing Practice

These findings point to recommendations for two practice arenas: direct care settings, and occupational health care settings.

When injuries occur, nurses look to peers and their immediate supervisors for the support they need related to next steps. As part of that process, it is critical that nursing management and supervisors maintain familiarity with post-exposure policies and procedures and assure policies and procedures are kept up-to-date. The process of creating and maintaining a culture of safety that not only serves to prevent injury, but also encourages reporting of injuries when they do occur involves collaboration between all members of the health care team. The ultimate responsibility for engendering and communicating the value attached to maintaining a safe work environment and reporting culture, however, rests with executive and nursing leadership within healthcare facilities.

Individual nurses should be provided the tools and resources necessary for safeguarding health and preventing injury. They must also be empowered and encouraged to advocate for changes related to health and safety within the patient care settings in which they practice. In some healthcare facilities, health and safety committees have been established as a mechanism for bringing needed change. Every injury that occurs needs to be viewed as a potential opportunity for improving health and safety within patient care units. Injured nurses should also be extended an opportunity to become actively engaged in efforts to improve health and safety within their workplace.

Social support has been identified as a critical need for nurses who experience PI. It is again important for nursing management to take the lead in acknowledging and communicating concern when nurses are injured. Staff should also be encouraged to support injured peers and

nursing management needs to communicate sensitivity to the potential need for accommodation following injuries, particularly in the case of nurses who have been prescribed PEP. Individual needs of injured nurse should be identified and met in collaboration with occupational health team members.

Members of the occupational health team have an obligation not only to the healthcare employer, but also to injured employees. In this study, particular circumstances were identified with the potential to lead to increased vulnerabilities for injured nurses in the post-exposure period. Nurses without identifiable systems of social support upon which they can depend, and nurses who are exposed to high-risk patients, are prescribed PEP, and/or will be facing prolonged periods of uncertainty related to testing outcomes are particularly vulnerable to heightened levels of stress and anxiety in the post-exposure period. As a routine part of post-exposure care, injured nurses should be evaluated relative to availability of social support and counseling services should be made available as needed. Nurses who've been exposed to HIV or hepatitis positive source patients or who have been prescribed PEP should be followed more closely until the testing period is completed in order to assess their need for additional services and support.

Institutional continuing education standards need to be established and enforced for PEP prescribers. Concerns raised by Henderson (2001) point to the need to assure that occupational medical personnel and emergency department providers are fully informed regarding guidelines for PEP administration and associated drug toxicities. Occupational health providers have an obligation to assure nurses and other healthcare workers are fully informed prior to making any decision regarding PEP. Injured workers should also receive information that will help prepare them for the potential nature and severity of drug regimen side effects. In addition, nurses who are prescribed PEP should be monitored closely in relation to the severity and nature of side

effects and provided re-evaluation, additional treatment options, and support and work accommodation as needed.

Follow-up testing periods were also identified as a particularly anxiety-provoking time for injured nurses. Every effort should be made by occupational staff to facilitate quick turn-around on testing and staff should communicate directly with nurses regarding test results. Finally, it is important that care and support provided following PIs not assume a one-size fits all mentality. Rather, injured nurses should be treated as human beings with the same basic need for dignity and respect as other patients within the healthcare system.

Nursing Research

Based on the findings of this study, there is a need for future research and knowledge development in several areas. The first relates to knowledge gaps that exist related to PI reporting. To-date, research in this area has been descriptive – almost an afterthought relative to the problem of PI, despite its importance. There has been no in-depth study related to the phenomenon of PI reporting. We need a better understanding not only of the barriers to reporting these injuries – and their prevalence of those barriers within the current healthcare system – but also an understanding of what factors facilitate nurse reporting. Participants in this study who all reported their injuries, did so in the context of busy units, short-staffing and, in some cases, supervisors who did not facilitate or encourage their reports. In prior studies, nurses cited these same factors as rationale for not reporting an injury. It is apparent, that a clear understanding of PI reporting motivations and behaviors is lacking within the current research literature and could be addressed by utilizing a phenomenological approach. Concurrent data collection to measure outcome variables relative to workplace factors and culture would also

allow relationships between organizational factors and nurses' reporting behaviors and motivations to be examined.

Another recommended area of inquiry based on these study findings related to the PEP experience. It appears clinicians who prescribe these powerful and toxic drugs following PIs either do not have adequate knowledge related to the nature and severity of PEP side effects – as was suggested in this study by two NPs who have prescribed them for patients in their own practices – or there is little appreciation for what injured nurses and other healthcare workers experience when they take these toxic drug regimens. The experience of participants on PEP regimens was profound in this study and there was little evidence of sensitivity to that fact, based on lack of follow-up and attentiveness by occupational health practitioners. Currently available research does nothing to address this existing knowledge gap. Again, phenomenological approach would be helpful in this area of knowledge development.

The final recommendation for future research based on findings from this study relates to the need to gain a better understanding of the psychological impact of these injuries. It is clear that the psychological burden imposed by PIs on injured workers is significant. Currently lacking within the research literature is an ability to understand the exact nature, extent and duration of the psychological impact of these injuries. It appears, based on participant accounts and some case reports, that there may be individuals – particularly among nurses who are exposed to high-risk patients – who suffer significant psychological distress during and beyond the period of post-exposure testing. A clearer understanding of the psychological impact of these injuries could be accomplished through conduct of multi-center prospective studies of healthcare workers who experience PIs. Such research could have important implications for health policy related to guidelines for post-exposure care, and the issue of mandatory testing of high-risk source patients.

Health Policy

Challenges remain with respect to every aspect of post-exposure care following PIs. Findings in this study provide support for health policy reforms at local, state and federal levels. Given the estimated 400,000 to 600,000 PIs that occur annually in the US and the burden associated with these injuries, the first priority in relation to health policy involves enforcement of current federal law and regulations aimed at PI prevention.

Over the past decade, a number of reforms have been enacted at the level of federal and state government related to PI prevention and post-exposure management. Perhaps the most important reform was the November 2000 passage of the federal Needlestick Safety and Prevention Act (NSPA). Representing a culmination of years of effort by individuals across the country – many of them nurses – the bill's passage directed changes to the 1991 Occupational Safety and Health Administration (OSHA) Bloodborne Pathogen Standard through legislative mandate. Under provisions of the new law, the BPS was amended and OSHA promulgated regulations that required employers to provide safety engineered sharp devices and to develop and annually update exposure control plans. One of the most critical requirements of the new federal law is that employers demonstrate evidence of front-line healthcare worker involvement in the selection and evaluation of these devices.

Since passage of the NSPA, the CDC has issued updated guidelines in 2001 and 2005 for management of occupational exposures to HIV and hepatitis as well as PEP recommendation. Current CDC guidelines (CDC, 2005b) include recommendations that healthcare workers with exposure to HIV receive follow-up counseling, post-exposure testing, and medical evaluation regardless of whether PEP is administered. Testing is recommended at baseline, six weeks, 12

weeks and six months post-exposure. For healthcare workers taking PEP, it is recommended that monitoring for drug toxicity occur at baseline and two weeks after PEP is begun.

Participant concerns and experiences related to PEP administration and follow-up in this study point to the need to strengthen federal post-exposure guidelines. Current CDC/OSHA post-exposure guidelines provide few specifics for employers and providers with respect to minimum provider qualifications for informed PEP administration and follow-up. Insufficient provider knowledge related to provision of PEP not only impedes informed decision-making by injured healthcare workers, but also decreases the likelihood that worker information needs related to PEP side effects will be met.

Concerns raised by one NIH expert (Henderson, 2001) support the need to ensure that occupational medical personnel and emergency department providers are fully informed regarding guidelines for PEP administration, associated drug toxicities and the need for close monitoring and follow-up. Minimum continuing education standards need to be established and enforced at a local and federal level for PEP prescribers in occupational health settings and emergency departments. Providers as well as employers should be held accountable for meeting and maintaining established educational standards on an annual basis. Findings in this study also support the need for more explicit CDC guidelines to encourage routine initiation of post-exposure counseling and follow-up for nurses who are prescribed PEP or exposed to HIV positive or other high-risk source patients.

Currently existing knowledge gaps related to the nature and extent of psychological effects of PIs, and PI reporting also indicate a need to make federal funding available for future research. There is a clear need to better understand the psychological effects of these injuries, which, in the absence of infection transmission, remain largely underappreciated. A clearer understanding of

reporting behaviors and organizational factors that facilitate reporting is also needed in order to become successful in building effective reporting cultures.

When injuries do occur, care should be available that is appropriate and responsive to healthcare workers' needs. Employers should be required to establish mechanisms, in addition to annual exposure control plans currently required by OSHA, to facilitate care that is responsive to the needs of injured workers. In many facilities across the country, health and safety committees have been established as one means for driving continuous quality improvement in relation to post-exposure care. Such committees need to be recognized as best practice in efforts to provide and improve PI care.

It is evident based on the variable nature of participants' knowledge regarding current guidelines for post-exposure care and workers rights under OSHA, that more needs to be done to educate practicing nurses regarding occupational risks, precautions and the rights legally afforded them with respect to worker health and safety. Given the currently limited resources of the Occupational Safety and Health Administration with respect to enforcement of federal and state health and safety requirements, nurses and other healthcare workers must be armed with information that empowers them to take steps necessary to protect their own health and safety. To that end, state, federal and accrediting agencies should establish and enforce minimum educational standards for curriculum development in academic as well as provider settings related to workplace health and safety throughout the country.

At the local level, healthcare employers should be required to apprise workers annually of employer obligations as well as workers' rights under the current law. At present, employers have no legal obligation to ensure nurses and others at risk of PI are made aware of their rights. Included among those rights are: the right to receive proper training for use of safety devices; the

right to be involved as a front-line user in the evaluation and selection of safety devices, and the right to anonymously and directly report health and safety violations to OSHA.

Another recommendation for health policy reform relates to efforts currently directed towards improving patient safety within the healthcare industry. Worker health and safety and injury prevention must assume the same level of priority and attention within the current healthcare system as patient safety and medical error prevention. It is clear that systems that assign individual blame rather than encourage nurses to report only contribute to persistent trends of PI underreporting and perpetuate conditions that undermine worker health and safety. More aggressive efforts need to be aimed at building systems of care both for patients and healthcare workers that will eliminate entrenched systems of individual blame, particularly with respect to occurrence of PIs.

Summary

The purposes of this study were to explore and describe US registered nurses' experience of percutaneous injury and its aftermath and to understand the meanings of the phenomenon. An interpretive phenomenological approach was utilized to carry out the study. Van Manen's organizing framework, consisting of four existential themes, was used throughout this study as a reflective guide. As a result of having experienced a percutaneous injury, transformations in the nurses' lifeworlds of embodiment, relationality, and temporality occurred.

This study represents the first substantive scientific understanding of the human experience and meaning of PIs and their aftermath. Three major themes emerged from a hermeneutic process of phenomenological reflection and interpretation as the essential structure that captured the essence and meanings of the phenomenon of PIs and their aftermath among registered nurses in this study. *Being shocked: The potential of a serious or life-threatening infection* was

revealed as the essence of the experience of percutaneous injury for the eight nurses who participated in this study. *Being shocked: The potential of a serious or life-threatening infection* was made up of three dimensions: *responding viscerally and emotionally*; *acting on the body to reduce contamination*; and *feeling the urgency for immediate care*.

The meanings of the phenomenon and its aftermath were captured by two themes: *needing to know it's going to be okay* and *sensing vulnerability*. The essential theme *needing to know it's going to be okay* was constituted by two dimensions: *assessing risk*, and *seeking post exposure intervention and caring responses from others*. *Sensing vulnerability* was comprised of three dimensions: *facing the fragility of health*; *distinguishing supportive vs. non-supportive relationships*; and *being vigilant as necessity*.

It is evident, based on findings in this study, that participants' lived experience of PI involved a range of thoughts, emotions, actions and awarenesses that offer a better understanding of the meanings of PIs and their aftermath. These findings also contribute knowledge to inform nursing education, nursing practice, health policy and future research. As human beings and healthcare consumers, nurses are morally deserving of care that reflects their lived, contextual realities and concerns with respect to PIs. Attendance to nurses' healthcare needs also allows them to better fulfill their promise of responsible care to society. It is, therefore, an ethical responsibility of both the profession and the larger healthcare system to endeavor to better understand and meet the needs of nurses who experience these injuries.

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APPENDIX A

Occupational Health Nurse Referral Solicitation Letter

Dear Nurse Colleague:

My name is Karen Daley. I am currently a PhD student in nursing at Boston College and am writing to make you aware of a study I am conducting for my dissertation research entitled: *The Lived Experience of Percutaneous Injuries among Registered Nurses: A Phenomenological Study*.

I believe a better understanding of the meanings associated with percutaneous injuries and the extent to which they impact nurses' lives may have important implications for post-exposure care. I hope to enlist your help in making nurses aware of the opportunity to share their experience through participation in this study.

Registered nurses who have sustained a sharps injury within the previous 24 months are eligible for participation, which involves one or more face-to-face interviews. Nurses interested in more information about the study can contact me directly by phone at (617) 596-1381 or email: daleykg@bc.edu.

This study has been approved by the Boston College Institutional Review Board (IRB). The IRB of [entity name] has reviewed the study protocol and has determined that no additional approval is needed. Study results will remain confidential and not be shared with [entity name]. In addition, all individual nurse data will be de-identified and presented in a way that will not link participants to their employment at [entity name].

Thank-you in advance for whatever help you can provide in making injured nurses aware of the study.

Karen Daley, PhD(c), MPH, RN, FAAN

Boston College Connell School of Nursing

APPENDIX B

Participant Recruitment Notice

RESEARCH STUDY ON SHARPS INJURIES

Registered nurse volunteers are being sought as participants in a study designed to provide a better understanding of the meanings associated with the experience of sharps injuries. Nurses who have sustained their injury within the previous 24 months are eligible for participation, which involves one or more face-to-face interviews.

For more information, contact the investigator Karen Daley, RN by phone at (617) 596-1381 or email: daleykg@bc.edu

APPENDIX C

Phone Screening Log

Contact date

Recruitment source

Injury date

Eligible?

First name

Phone

Meeting date

Meeting place

APPENDIX D

Informed Consent for Participation as a Subject in “*The Lived Experience of Percutaneous Injuries among US Registered Nurses: A Phenomenological Study*”

You are being asked to be in a research study of the experience of sharps injuries from the perspective of registered nurses. It is anticipated that this study will contribute to a better understanding of nurses’ experiences of these injuries. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

You were selected as a possible participant because you were referred by another nurse or have read about the study online and meet eligibility requirements. Eligibility for study participation is based on your experience of having sustained a sharps injury within the past 24 months. You are not eligible if, prior to the time of your injury, you had a history of anxiety disorder or depression requiring medical treatment or psychiatric care.

The purpose of this study is to explore and understand the experience and meanings of sharps injuries from the perspective of registered nurses. Nurse participants in this study are from the New England region. If you agree to be in this study, we would ask you to participate in one or more face-to-face individual interviews conducted at a time and setting that are convenient for you. Interviews will be audiotaped and transcribed verbatim in order to present an exact representation of the information you share. We would also ask you to complete a brief questionnaire that will provide us with personal demographic information.

Completion of the demographic questionnaire will take approximately five minutes. It is anticipated that each interview will last one to one-and-one-half hours. The number of actual interviews will depend on the individual participant. During these interviews, you will be asked a limited number of open-ended questions in order to help clarify and explore the depth and meaning of your experience. There are no right or wrong answers to these questions. We simply ask that you respond as openly and completely as possible in describing your own experience.

The study has the following risks. To the best of my knowledge, the risk of harm posed to you by thinking about these questions is minimal when compared to what you experience in everyday life. However, some people do experience emotional upset when they are asked to think about feelings in relation to a particular event that they perceive as stressful. In the event you experience these feelings, I can put you in touch with an experienced mental health advanced practice nurse who is available to speak with you free of charge and to assist you, as needed, with appropriate referrals for additional support services. There may also be other unknown risks to participation.

There are no direct benefits to you for participating in this study. Participation does afford you an opportunity for you to share your own experience following your injury to help employers and others in health care better understand the feelings and impact associated with sharps injuries and the type of support that may be needed as these injuries occur. If you choose to participate in this study, you are expected to be one of approximately 8 to 15 registered nurse participants. There will be no payment or cost to you for your participation in this study.

I will make every effort to keep your research records confidential, but I cannot assure absolute confidentiality. Records that identify you and the consent form you sign may be looked at by a regulatory agency overseeing human subject research and the Boston College Institutional Review Board. All computer data will be password protected. All records of this study will be kept private and secure in a locked file. Only the Investigator and my Boston College faculty dissertation committee advisors will have access to your personal or interview data.

After data review and verbatim transcription is completed, all identifiers that connect the interview with participants will be removed. Following transcription of interview audiotapes and a review of the text for accuracy, audiotapes will be cut up and destroyed. No one else, including employers, will have access to your data. In any sort of report the Investigator may publish, no information will be included that will make it possible to identify a participant. No identifying information will be attached to the interview transcript. Rather, the Investigator will ask that you choose a pseudonym or alias that will be used as your sole identifier. Only your pseudonym will be used as an identifier for your data.

Your participation in this study is completely voluntary. If you choose not to participate, it will not affect your current or future relations with the University. You may withdraw or stop participation in the study at any time, for whatever reason you choose. There is no penalty for not taking part or for stopping your participation in the study.

The nurse conducting this dissertation research is Karen Daley, a doctoral student at Boston College Wm. F. Connell School of Nursing. The faculty advisor and dissertation chair on this

study is Dr. Rosanna DeMarco at Boston College. If you have any questions or concerns regarding this study, Karen Daley can be reached at 617-596-1381 or daleykg@bc.edu. In the event you feel you have been injured or your confidentiality has been breached during participation in this study, Dr. Rosanna DeMarco can be reached at 617-552-1878 or demarcro@bc.edu. If you have any concerns about your rights as a study participant, you may contact: Director, Office for Human Research Participant Protection, Boston College at (617) 552-4778, or irb@bc.edu. You will be given a copy of this form to keep for your records and future reference.

☐ I have read (or have had read to me) the contents of this consent form and have been encouraged to ask questions. I have received answers to my questions. I give my consent to participate in this study. I have received (or will receive) a copy of this form.

Study Participant (Print Name): _____

Participant Signature: _____ Date _____

APPENDIX E

Interview Guide

General questions:

- Tell me about yourself.
- Tell me about your practice environment.
- Can you describe a typical day before your injury?
- Tell me about the actual day your injury occurred.
- Tell me about your injury.
- Can you describe a typical day since your injury?
- When you think about your injury, what stands out?
- What does your experience mean to you?
- How has your injury affected you?
 - If so, how?
 - If no, why do you think that is?

Probing questions used to elicit more in-depth recounting of lived experiences:

- Could you give me an example of that?
- Can you elaborate more on that?
- What was that like?
- Do you remember how you felt?

- What were you thinking at that time?
- When you think about that now, is there anything else that comes to mind?
- How did you respond to that?
- Can you say what stands out most in relation to that experience?
- What, if any, needs did you have as a result of the experience?
- It sounds like you are saying..... Is that correct?

APPENDIX F

Demographic Data Questionnaire (*please print worded responses*)

Participant pseudonym _____

Date of first interview _____

What is your age? _____

What is your current relationship status?

Single ____ *Married* ____ *Separated* ____ *Divorced* ____

On a scale of 1-5, how would you rate your current support system? (see below) _____

(1=*very supportive* 2=*somewhat supportive* 3=*neither supportive nor unsupportive*
 4=*somewhat unsupportive* 5=*very unsupportive*)

What is your highest level of education completed?

Diploma ____ *AD* ____ *BS* ____ *Masters* ____ *Doctoral* ____

What is your current practice area?

Med-surg ____ *ICU* ____ *OR* ____ *ED* ____ *Community nursing* ____ *LTC* ____ *Other* ____

How many years of experience do you have as an RN?

1 – 3 years ____ *4 – 6 years* ____ *7 – 9 years* ____ *10 – 12 years* ____ *>12 years* ____

In what type of care setting did your needlestick injury occur?

community hospital ____ *urban hospital* ____ *non-hospital setting* ____

If hospital, approximate number of beds:

< *100 beds* ____ *100 to 300 beds* ____ *301 to 500 beds* ____ > *500 beds* ____Have you personally experienced other needlestick injuries? *yes* ____ *no* ____*If yes, how many?* ____ *In what setting?* _____How long ago (in months) was your last NSI prior to this one? _____

Did you report *each* prior injury? *yes* _____ *no* _____ *If no, why not?* _____

APPENDIX G

Contact Summary Sheet

Participant Pseudonym _____

Date of Contact _____

Today's Date _____

Written by _____

1. What were the main issues or themes in this contact?
2. Anything else that was salient or interesting about this contact?
3. Questions to consider at next contact?
4. Other observations:

APPENDIX H

Table 1

Sample Demographic Characteristics

RN	Age	Education	Years exper	Practice specialty	# Hospital beds	Prior injury
#1	53	BS	>12	Hematology-oncology	NA	Y
#2	29	BS	4-6	Burn ICU	>500	N
#3	45	BS	1-3	Medical-surgical	100-300	N
#4	59	MS	>12	Primary care	NA	Y
#5	41	MS/NP	>12	Wound care	>500	N
#6	52	BS	>12	Operating room	301-500	Y
#7	53	PhD/NP	>12	Emergency	301-500	Y
#8	28	MS/NP	1-3	Community health	301-500	N